TAMIL NADU AGRICULTURAL UNIVERSITY

FIFTH ANNUAL REPORT

April 1, 1975 to March 31, 1976

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1. INTRODUCTION

The Fifth Annual Report of the University covers the period from April 1, 1975 to March 31, 1976. During the year the University made significant progress in the three fields of teaching, research and extension education. The organisation and working of the Research Council and Extension Education Council in the University are unique and they have been instrumental in orienting our research work towards solving field problems. In addition, a notable beginning has been made through the formation of University Co-ordinated Agronomic Experiments (UCORP) with a view to formulate cropping system with suitable package of practices for economic use of land, water and sunlight in different agro-climatic regions of the State. M/s. Seshasayee Papers and Boards Limited, Erode and M/s. South India Viscose Limited, Mettupalayam granted Rs. 1.9 lakhs and Rs. 25,000/ year for three years, respectively, for undertaking research work in Forestry in the University. During the year, two new Research Stations one at Mettupalayam in Coimbatore district and another at Yercaud in Salem district were started.

Authorities of the University : All the authorities of the University, viz., the Board of Management, Academic Council, Board of Studies and Board of Examinations functioned normally during the year. The Board of Management met four times and the Academic Council three times during the year. The Board of Studies of the Faculties of Agriculture, Basic Science and Humanities, Veterinary and Animal Sciences met once while the Board of studies of Faculty of Agricultural Engineering met twice during the year. The Board of Examinations met six times to approve the question paper setters, internal and external examiners and also to declare the results of various examinations.

During the year, the Board of Management approved the creation of a separate Department of Tamil in the University. The Board further decided to take over 200 hectares of forest land in the Odanthurai Reserve Forest, near Mettupalayam on lease from the Forest Department of the State Government and also approved the purchase of a private farm at Yercaud. The Board also approved in principle to implement the new University Grants Commission pay scale for the University technical staff after the State Government gives its concurrence.

Teaching : As in the past there was a considerable rush for admission to the various degree programmes during the year under report. A new Post-graduate programme leading to M. Sc., (Environmental Biology) degree has been started with an admission strength of 5 seats. There was heavy rush for admission to this course. Mostly candidates with I class marks in Part III of the P. U. C. were admitted to B. Sc. (Ag) and B. Sc. (Hort.) degree programmes and candidates with marks of 60 per cent and above were admitted to B. E. (Agri.). The annual university examinations for the II, III and Final year B. Sc. (Ag.) degree programme, for the B. V. Sc. and M. V. Sc. in the Madras Veterinary College were conducted during April, May and June, 1975. Supplemental examinations were conducted during October, November, December 1975 and January, 1976.

Research : As against 1076 projects in operation during the past year, there are over 1123 projects covering different branches of Agriculture, Horticulture, Animal Husbandry, Agricultural Engineering, Fisheries, Forestry, Food Technology, Basic Sciences and Humanities. The Scientists of the University published 481 research papers during the year as against 398 during last year. A notable achievement in the field of research was evolving new varieties and cultures in rice, pulses and vegetables. Breedieg work for evolving a strain to replace the long duration paddy for *samba* season (July - August to December - January) in single crop wetlands has resulted in selecting two high yielding cultures, 13945 and 13531 which are of semi-dwarf stature, with a duration of 165-170 days. At the Madurai campus, in the project for evolving superior rainfed rice, 23 cultures isolated from the cross IR 8 x Chitraikar were found to be early maturing combining with the high yield potential of IR 8. In pulses two new strains, one each in greengram and blackgram, were released. In greengram Co. 3, a short duration dryland variety recorded 29 per cent increased yield over Co. 2. Similarly in blackgram, Co. 3 registered 36 per cent increased yield over Co. 2. In vegetables, five new varieties one each in bhendi, snakegourd, ribbed gourd, tapioca, and sweet potato were released. These posses the characters of high yield and better quality. In the crop sequence study at Coimbatore, rice (Bhavani) - rice (Kannagi) - rice (IR. 20) gave the maximum income with a better per day income for wetlands. In Sorghum. the University Cholam Hybrid 1 (UCH 1) proved to be a best yielder recording 6.5 tonnes per hectare grain with 24 tonnes straw. This hybrid can be grown throughout the year. Two redgram mutants S.18 and S.19 have been identified and are in pre-release stage. In sunflower, a short statured variety E.C. 101495 combining earliness and high yield has been identified. In cotton, two selections ELS. 380 and ELS. 481 superior to MCU. 5, were isolated. Besides, two hybrids H2 and H3 with superior kapas yields of 58.8 per cent and 33 per cent over CBS 156 are under multiplication trials. For rainfed areas, selection CRH. 68 and CRH. 71 superior to Bharathi registering 142 per cent and 77 per cent of higher kapas yield/ha have been identified. For gardenland cropping system, cotton (MCU. 5) - cholam (CSH.5) - ragi (Co. 10) have given maxi-

mum profit with higher per day income. A notable beginning has been made through the formulation of University Coordinated Experiments (UCORP) with a view to formulate cropping systems with suitable package of practice including economic use of land, water and sunlight in different agro-climatic regions of the State.

The problems of growth pattern of labour in Coimbatore taluk, farm plan study, effect of multiple cropping programme on employment potential and demand for credit, study on energy crisis as affecting farm production and the quantum of application of fertilizers by the farmers in two blocks of Madurai district were studied in Economics Department.

The department of Agricultural Extension has conducted studies on the role of farmers' training groups, effect of posters, farmers retentivity of knowledge on selected farm practices taught through different combinations of extension methods, studies on the communicability and utility of information material prepared for extension work, studies on the role of farmer's training centre in developing new leaders to act as extension agencies and studies on the attitude of agriculturally educated youth. These have direct relevance to the extension programme of the State Government.

The department of Food Technology has standardised optimum condition for the preparation of Suji (Rava) from tapioca. Recipes for Uppuma, Kesari and Laddu have been made and they are found acceptable by the people.

In the department of Forestry, raising Eucalyptus seedlings in polythene containers and planting them showed better germination and faster growth. Attempts made to evolve suitable propagule for bamboos through pot and mini pot studies showed that cut rhizome chains of *Bambusa bambos* will regenerate, the average regeneration being 60 pet cent.

The department of Fishery Sciences had formulated a number of projects to popularise fish culture among farmers who own ponds and wells. Experiments on composite fish culture in earthernponds using groundwater with supplementary feeding showed that the fishes attained good growth, the gross production works out to 2477 kg/ha. In the ponds fed with sewage water with no supplementary feeding the gross production works out to 1642 kg/ha over a period of 100 rearing days.

In the faculty of Agricultural Engineering experiments have indicated several methods of increasing irrigation efficiency. Among the machinery developed during the year are a sheep-foot roller, furrow opener, sunflower seed-sheller, inter-cultural equipment for cashew plantations, rectangular metal bin drier, paddy pre-cleaner and hot air generator. In post-harvest

technology cheaper containers like polythene lined bamboo bins are found to be better and cheaper for storing grains.

In the department of Biology studies on mixing of *Azotobacter* cell suspension at three litres per cartload found to enrich the well decomposed compost within a month. The department of Languages made studies in the messages communicated through the media of journals, radio, extension educational communications in the Farmers Training Centre and the languages used in the farm broadcast.

The department of Animal Husbandry has been engaged in research work on the economics of dairy animal feed, commercial chicken rearing and evolving hybrid leghorn to suit the the local agro-climatic conditions. it was found that cotton seeds fed to the dairy animals can be replaced upto 33 per cent with molasses without adversely affecting the yield.

Extension Education : The Directorate of Extension Education is making all efforts to help the farmers of the State in collaboration with the State Department of Agriculture, All India Radio, and the press by disseminating results of research. It serves as an important link between the research workers of the University on the one hand and the extension workers of the State Government and the farmers of Tamil Nadu on the other. The Communication Centre and the Farmers Training Centre at the main campus, the Farmers Training Centre and the National Demonstration Scheme at Madurai Campus and the two Advisory Councils at Coimbatore and Madurai are engaged in carrying out extension education activities of the University. The Directorate of Extension Education organised training programme for 36 Deputy Agricultural Officers and an inservice refresher training to 95 technical offfcers (Agriculture) of the State Bank of India. Ten I. A. S. Probationers and 9 Probationery Deputy Collectors underwent Agriculture Training for two weeks. Seminars and group meetings were conducted at Coimbatore and Madurai centres on paddy, millests, cotton groundnut, etc. for the benefit of farmers. Campaigns were also organised on plant protection and fertiliser application. Forecasts of pests and diseases were broadcast twice a week, through All India Radio, Coimbatore and Trichy. Appropriate prophylactic and control measures were also suggested to the farmers. In Farm School on Air by All India Radio, 13 lessons on intensive cultivation on vegetables, cotton and rainfed millets and modern dairy farming were broadcast. The University imparted correspondence courses to 375 farmers in the subjects of Intensive Paddy Cultivation, Modern Poultry Farming, Tractor maintenance, Seed Production, Intensive Vegetable, Cotton, Banana cultivation, Farm budgetting, Soil and Water management and Modern Dairy Farming.

The Fourth Convocation of TNAU held on January 17, 1976.

Inaugural function of the German Democratic Republic Research Project on Potash Fertilisation, November 10, 1975.

Hon'ble Dr. Jagjivan Ram, Union Minister for Agriculture and Irrigation inaugurating

Fourth Convocation of the University: The fourth convocation of the University was held on January 17, 1976. His Excellency Thiru. K. K. Shah, Chancellor of the University and the Governor of Tamil Nadu presided over the funtion. Hon'ble Dr. Jagjivan Ram, Union Minister for Agriculture and Irrigation who was the Chief Guest delivered the convocation address. Dr. G. Rangaswami, Vice-Chancellor of the University delivered the welcome address outlining the chief achievements of the University during the year. Hon'ble Si. Pa. Adithanar, Pro-Chancellor announced the institution of seven prizes (i) Shri Jagjivan Ram medal, (ii) Dr. (Mrs.) Jayalaksmi medal, (iii) Dr. Venkatachalam medal for Agriculture, (iv) Dr. Venkatachalam medal for Veterinary and Animal Sciences, (v) Dr. Clement Williams medal, (vi) Thiru. P. S. Jivanna Rao medal and (vii) Thirumathi Gangabai Venkateswaran medal. At the convocation nine candidates were conferred Ph. D. degree, ten M. V, Sc., degree, 59 M. Sc., (Ag.) degree, 49 B.V. Sc. degree and 168 B.Sc.(Ag.) degree in person while 2 Ph.D., 14 M.V.Sc. 23 M.Sc.,(Ag.), 51 B.V.Sc., and 64 B.Sc., (Ag.), were conferred degrees *in absentia*.

2. UNIVERSITY ADMINISTRATION

1.	Chancellor	:	Thiru. K. K. Shah Governor of Tamil Nadu
2.	Pro-Chancellor	:	Thiru. Si.Pa. Aditanar, M.A., Bar-at-law Minister for Agriculture (Upto January 31, 1976) Thiru. R. V. Subramaniyam, I.A.S. Adviser to the Governor (in-charge of the portfolio of Agriculture from March 12, 1976)
3.	Vice-Chancellor	:	Dr. G. Rangaswami
4.	Registrar	:	Thiru. K. N. Duraiswamy (upto August 31, 1975) Dr. T. R. Subramaniam (in-charge from September 1, 1975 to December 2, 1975 and regular from December 3, 1975)
5.	Comptroller	:	Thiru. G. Ramachandran
6.	Estate Officer	:	Thiru. S. Jagannathan
7.	Dean, Agricultural College and Research Institute, Coimbatore	:	Dr. T. R. Subramaniam (in-charge upto August 31, 1975) K. K. Krishnamurthy (in-charge from September 1, 1975 to November 11, 1975) Dr. V. N. Madhava Rao (in-charge from November 12, 1975 to January 31, 1976 and regular from February 1, 1976)
8.	Dean, Agricultural College and Research Institute, Madurai	:	Dr. C. V. Govindaswamy
9.	Dean, College of Agricultural Engineering, Coimbatore	:	Thiru. C. R. Shanmugham (in-charge upto January 31. 1976 and regular from Februry 1, 1976)
10.	Dean, Basic Sciences and Humanities, Coimbatore	:	Dr. V. Rajagopalan (in-charge from September 1, 1975 to December 3, 1975) Dr. D. Raj (in-charge from December 4, 1975 to January 31, 1976 and regular from February 1, 1976)

11. Director of Research	:	Dr. V. N. Madhava Rao (in-charge upto November 11, '75)
		Dr. Y. B. Morachan (in-charge upto November 12, '75 to January 31, 1976 and regular from February 1, 1976)
12. Director of Extension Education	:	Dr. Y. B. Morachan (in-charge upto November 11, '75
		Dr. K. K. Krishnamurthy (in-charge upto November 12, '75 to December 11, 1975)
		Dr. S. Jayaraj, (in-charge from December 12, '75 to January 31, 1976 and regular from February 1, 1976)

Board of Management :

The term of Office of the non-official members of the Board of Management of the University expired on November 24, 1974. The Chancellor nominated new non-official members in G. O. Ms. No. 1403 Agriculture Department, dated September 12, 1975 for a period of three years from the date of the G. O.

1. Dr. Rangaswami Vice-Chancellor	:	Chairman
2. Thiru K. Chockalingam, IAS, Special Secretary to Government Agriculture Department Tamil Nadu	:	Member (upto November 21, 1975)
Thiru R. Natarajan, IAS, Special Secretary to Government Agriculture Department Tamil Nadu		Member (From November 21, 1975)
3. Thiru S. Guhan, IAS, Secretary to Government Finance Department Tamil Nadu		Member
4. Thiru A. Venkataraman Director of Agriculture Madras-5	:	Member
5. Thiru M. Mayilvahanan, IAS, Director of Fisheries Madras-6	:	Member (upto February 5, 1976)
Thiru R. Nagarajan, IAS, Director of Fisheries Madras-6	:	Member (February 6, 1975)

6.	Dr. G. Venkatachalam Director of Animal Husbandry, Madras-6	:	Member (upto December 31, 1975)
	Thiru L. M. Menezes, IAS, Director of Animal Husbandry Madras-6	:	Member (From February 7, 1976)
7.	Thiru K. A. Boja Shetty, IFS, Chief Conservator of Forests Madras	:	Member
8.	Dr. B.W.X. Ponnaiah Agricultural Scientist Madras	:	Member
9.	Thiru K.A.P. Viswanathan Crop Farmer Tiruchirapalli	:	Member (From September 12, 1975)
10.	Janab Haji E.K.M. Ghani Sahib Livestock Farmer Erode	:	Member (From September 12, 1975)
11.	Thiru K. V. Subbiah Agro-Industries Pudukottai	:	Member (From September 12, 1975)
12.	Tmt. Umayal Ramanathan Woman Social Worker Karaikudi	:	Member (From September 12, 1975)
13.	Thiru V. T. Titus Educationist Madras	:	Member (From September 12, 1975)
14.	Dr. S.S. Shah Director Sugarcane Breeding Institute Coimbatore.	:	Member (upto March 28, 1975)
	J. Thuljaram Rao Director Sugarcane Breeding Institute Coimbatore.	:	Member (From March 29, 1976)
15.	Thiru T. O. Periaswamy (M. L. A. Coimbatore) (Elected from the Legislative Assembly)	:	Member (upto January 31, 1976)
16.	Thiru S. A. Rajamanickam M.L.C. Coimbatore (Elected from the Legislative Council)	:	Member

17.	Thiru K. N. Duraiswamy Registrar	Member-Secretary (upto August 31, 1975)
	Dr. T. R. Subramaniam, Registrar	Member-Secretary (From September 1, 1975)

Meetings of the Board of Management : During the year under report the Board met four times on September 17, 1975, December 2, 1975 January 16, 1976 and March 16, 1976. The following were the important decisions taken by the Board

1. Approved the Fourth Annual Report of the University.

2. Approved the Audited Annual Accounts of the University for 1973-74.

3. Approved the creation of a separate Department of Tamil in the University.

4. Approved taking over 200 hectares of forest lands at Odanthurai Reserve Forests near Mettupalayam on lease from the Forest Department of the State Government.

5. Sanctioned the purchase of a private farm at Yercaud for starting a Horticultural Research Station.

6. Approved in principle to implement the new University Grants Commission pay scales in the University after the State Government gives its concurrence.

7. Approved the payment of Rs. 100/- as special pay to the Professors posted as Deans and Directors in the University.

8. Resolved to accept Rs. 1.9 lakhs from M/s. Seshasayee Papers and Boards Limited, Erode and Rs. 25,000/- per year for three years from M/s. South India Viscose Limited, Mettupalayam for undertaking research work on Forestry in the University.

9. Decided to accept a gift when finally offered from a private trust from U.S.A. subject to the approval of the Governments of Tamil Nadu and India.

10. Approved the investment of money on short-term deposits when considered possible.

11. Approved the construction of buildings for the University Library.

12. Approved the construction of four quarters for the catagory of Assistant Professors/Instructors at the Regional Research Station, Bhavanisagar.

13. Approved the budget of Tamil Nadu Agricultural University for the year 1976-77.

14. Approved the construction of following buildings:

a) Students Hostel, Gymnasium and a Livestock Farm at the main campus at Coimbatore; and

b) Buldings for the Horticultural Research Station at Yercaud.

15. Noted the Implementation of the following schemes in the University:

1. "All India Coordinated Project for intensification of Research on the Improvement of Pulses" by Indian Council of Agricultural Research at Coimbatore and Madurai for the Period from 1974-75 to 1978-79.

2. "Investigation on the recycling of effluents from Sago Factories" by the Department of Science and Technology, Government of India, New Delhi for a period of three years, and

3. "Farm Management for planning Agricultural Development in the Hills of Tamil Nadu" for three years from the date of implementations by Indian Council of Agricultural Research.

Academic Council

Chairman:

Vice-Chancellor	:	Dr. G. Rangaswami

Members:

Secretary to Government Agriculture Department	:	Thiru R. Natarajan, I. A. S., Special Secretary to Government Agriculture Department, Fort St. George Madras-9.
Deans of Colleges		1. Dr. C. V. Govindaswamy, Dean, Agricultural College and Research Institute, Coimbatore.
		2. Dr. T. R. Subramaniam Dean, Agricultural College and Research Institute, Coimbatore. + Dr. T. R. Subramaniam (in-charge upto August 31, 1975) Dr. K. K. Krishnamoorthy (in-Charge from September 1, 1975 to November 11, 1975) Dr. V. N. Madhava Rao (in-charge from November 12, 1975 to January 31, 1976 and regular from February 1, 1976).
		3. Dean, College of Agricultural Engineering Coimbatore. Thiru C. R. Shanmugam (in-charge upto January 31, 1976 and regular from ...

4. Dean,
Faculty of Basic Sciences and Humanities, Coimbatore.

Dr. T. R. Subramaniam (in-charge upto August 31, 1975)

Dr. V. Rajagopalan (in-charge from September 1, 1975 to December 3, 1975).

Dr. D. Raj, (in-charge from December 4, 1975 and regular from Febuary 1, 1976).

5. Dr. V. Rathnasabapathy,
Dean,
Madras Veterinary College
Madras-7.

Director of Research

Dr. V. N. Madhava Rao (in-charge upto November 11, 1975)

Dr. Y. B. Morachan (in-charge from November 12, 1975 and regular from February 1, 1976).

Director of Extension Education :

Dr. Y. B. Morachan, (additional charge upto November 11, 1975).

Dr. K. K. Krishnamoorthi, (additional charge from November 12, 1975 to December 11, 1975).

Dr. S. Jayaraj, (additional charge from November 12, 1975 and regular from February 1, 1976)

Six members amongst the Heads of Departments to be nominated by the Vice-Chancellor ;

1. Dr. K. K. Krishnamoorthy,
Professor and Head of the Department of Soil Science and Agricultural Chemistry
Coimbatore.

2. Dr. V. Rajagopalan,
Professor and Head of the Department of Agricultural Economics,
Coimbatore.

3. Dr. P. Chandrasekaran,
Professor and Head of the Department of Agricultural Botany,
Madurai.

4. Thiru. K. R. Swaminathan, Senior Research Engineer, College of Agricultural Engineering, Coimbatore.

5. Thiru S. Kondas, Professor and Head of the Department of Forestry, Coimbatore.

6. Thiru N. V. Choodamani (upto 30-1-76) Professor and Head of the Department of Fishery Science Coimbatore.

Three persons having special knowledge or practical experience in different aspects of Agriculture to be nominated by the Vice-Chancellor.	1. Dr. C. N. Sambandam, Dean Agriculture Faculty Annamalai University Annamalainagar
	2. Dr. V. C. Kolandaiswamy, Director of Technical Education Madras-25.
	3. Dr. A. Gnanam, Professor of Plant Science. Department of Biological Sciences Madurai University. Madurai-21.
Registrar (Secretary)	Thiru. K. N. Duraiswamy (upto August 31, 1975)
	Dr. T. R. Subramaniam (from September 1, 1975).

Meetings of the Academic Council: The Academic Council met thrice during the year under report and the following decisions were taken:

1. Approved the modification in rules for evaluating students' performance in the trimester system of education.

2. Approved the amendment for the qualifications for admission to B. Sc. (Ag) and B.Sc. (Hort) degree courses.

3. Approved the requirements of candidates for admission to the new Post - Graduate degree programme, M. Sc. (Environmental Biology) in the faculty of Basic Sciences and Humanities and the courses for the same.

4. Approved (i) the new Regulations and syllabi for the B. V. Sc. and M. V. Sc. degree programmes and (ii) amendment to the procedure adopted for calculating the attendance requirement to all under-Graduate and post-Graduate students of Madras Veterinary College, Madras.

5. Approved the modifications in the curricula and syllabi of the under-graduate programmes in the Faculty of Agriculture.

6. Approved (i) the courses for the major field of specialisation for IV B. Sc. (Ag.) (ii) optional courses for the IV B.Sc. (Ag.), B. Sc. (Hort.) standing, (iii) optional tour for B. Sc. (Hort.) degree programme, (iv) evaluation procedure of the optional N. C. C. course.

7. Approved (i) the syllabus for the fourth year B. E. (Ag.) standing, (ii) the evaluation procedure of the optional tour for the fourth B. E. (Ag.) standing and (iii) the syllabus for the obligatory practical training for the IV B. E. (Ag.) degree programme.

8. Approved the recognition of degrees, diplomas and certificates awarded by other Universities.

9. Approved the procedure to "thank the Chief Guest" in the programme of the Convocation.

10. Recommended to the Board of Management (a) for the creation of certain research posts for the proposed New Research Stations of the University and in the University Departments (b) the successful post-graduate candidates for conferment of degrees (c) to confer degrees on the candidates who had passed out from Tamil Nadu Agricultural University.

Board of Studies: The four Boards of Studies constituted during the previous years continued during the period under report.

i) Agriculture
ii) Agricultural Engineering
iii) Basic Sciences and Humanities
iv) Veterinary and Animal Sciences

Each Board consists of the following members:

1. Dean of the Faculty - Chairman
2. Other Deans in the Faculty
3. Heads of Departments in the Faculty
4. All Professors in the Faculty
5. Two elected representatives from among the Associate Professors Assistant Professors and Instructors (Research Assistants)

Faculty of Agriculture:

Elected Members (term expires on March 25, 1976)

1. Dr. K. G. Shanmugavelu
   Associate Professor of Horticulture
   Agrrcultural College and Research Institute
   Coimbarore

2. Thiru K. C. Chandy
Entomologist
All India Co-ordinated Rice Improvement Project
Aduthurai

3. Thiru V. S. Subramanyan
Assistant Professor of Agricultural Extension
Agricultural College and Research Institute
Coimbatore

4. Thiru G. Soundarapandian
Assistant Professor of Agricultural Botany
Agricultural College and Research Institute
Coimbatore

5. Thiru N. Ravindran
Instructor in Agricultural Extension
Agricultural College and Research Institute
Coimbatore

6. Thiru M. Subramanyan
Instructor in Agricultural Botany
Agricultural College and Research Institute
Madurai

Dr. J. Samaraj, Dean, Agricultural College and Research Institute, Kerala Agricultural University, Vellayani and Dr. A. Appa Rao, Director of Research, Andhra Pradesh Agricultural University, Hyderabad nominated by the Vice-Chancellor as Members of Board of Studies of Faculty of the Agriculture for a three year term, continued to be the members during the year. They will hold Membership upto March 25, 1976.

Faculty of Agricultural Engineering:

Elected Members (term expires on March 25, 1976)

1. Thiru S. Subramanian
Associate Professor
Department of Soil and Water Conservation Engineering
College of Agricultural Engineering
Coimbatore

2. Thiru G. Devadason
Associate Professor
Department of Farm Machinery
College of Agricultural Engineering
Coimbatore

3. Thiru M. Balasubramanian
   Assistant Professor
   College of Agricultural Engineering
   Coimbatore
4. Thiru P. Natarajan
   Department of Agricultural Structures
   College of Agricultural Engineering
   Coimbatore
5. Vacant
6. Thiru J. Selvarajan
   Instructor
   Agricultural Processing
   College of Agricultural Engineering
   Coimbatore

Thiru S. E. Anantharaman, Chief Engineer, Tamil Nadu Agro-Industries Corporation, Madras and Thiru K. C. Chaturbujanathiah, Principal in-charge, Agricultural Engineering Institute, University of Agricultural Sciences, Raichur have been nominated by the Vice-Chancellor as members of the Board of studies for the Faculty of Agricultural Engineering, continued to be members during the year. They will hold membership upto March 25, 1976.

Faculty of Basic Sciences and Humanities:

Elected Members (term expires on March 25, 1976)

1. Dr. C. Suyambulingam
   Associate Professor of Mathematics
   Agricultural College and Research Institute
   Coimbatore
2. Dr. G. Obliswamy
   Associate Professor of Microbiology
   Agricultural College and Research Institute
   Coimbatore
3. Dr. M. Lakshmana Singh
   Assistant Professor of Languages
   Agricultural College and Research Institute
   Madurai
4. Thiru L. S. Kandaswamy
   Assistant Professor in Tamil
   Agicultural College and Research Institute
   Coimbatore

5. Thiru P. Muthukrishnan
Instructor in Microbiology
Agricultural College and Research Institute
Madurai

6. Thiru Israel Mansingh
Instructor in Microbiology
Agricultural College and Research Institute
Madurai

Dr. S. Krishnaswamy, Head of the Department of Biology, Madurai University, Madurai and Dr. V. S. Ramadoss, Head of the Department of Botany, Shri Venkateswara University, Tirupathi nominated by the Vice-Chancellor continued to be members. They will hold the membership upto March 25, 1976.

Faculty of Veterinary and Animal Sciences :

Elected Members (Term expires on January 19, 1977)

1. Dr. K. M. Selvaraj
Reader in Extension
Madras Veterinary College
Madras

2. Dr. L. V. Gopalakrishnan
Reader in Physiology
Madras Veterinary College
Madras

3. Dr. R. A. Venkatesan
Lecturer in Bacteriology
Madras Veterinary College
Madras

4. Dr. A. R. Krishnan
Lecturer in Poultry Science (Genetics)
Madras Veterinary College
Madras

5. Dr. P. A. Balu
Assistant Lecturer in Therapeutics
Madras Veterinary College

6. Dr. M. Pakir Azad
Assistant Lecturer in Extension
Madras Veterinary College
Madras

Dr. C. T. Peter, Dean, Faculty of Veterinary and Animal Sciences Kerala Agricultural University, Trichur and Dr. R. D. Nanjiah, Director of Instruction, Veterinary College, Hebbal, Bangalore were nominated by the Vice-Chancellor as Members of the Board of Studies in the Faculty of Veterinary and Animal Sciences.

Meetings of the Board of Studies : The Boards of Studies of the Faculties of (i) Agriculture, (ii) Basic Sciences and Humanities and (iii) Veterinary and Animal Sciences conducted each one meeting during the year. The Board of Studies of the Faculty of Agricultural Engineering conducted two meetings.

The Board of Studies for the Faculty of Agriculture transacted the following items :

Considered and recommended to the Academic Council for approval :

1) Certain changes and modifications in the curricula and syllabi of the under-graduate programme.

2) Course for the Major field of specialisation for IV year B.Sc. (Ag.) standing and also the optional course for the IV B.Sc., (Ag.) and B.Sc. (Hort.) standing.

3) Details of duration and evaluation procedure of the optional tour of the curricula of the B.Sc. (Hort.) degree programme.

4) Evaluation procedure of the optional N.C.C. Course.

5) Courses for the M.Sc. (Environmental Biology) degree programme and B.V.Sc. degree. programme.

The Board of Studies for the Faculty of Agricultural Engineering transacted the following items:

Considered and recommended to the Academic Council for approval:

1) The syllabus for the IV year B.E. (Ag.) degree.

2) The courses in Agricultural Engineering and the changes made in the common courses offered by other faculties.

3) Practical Training in Agricultural Engineering.

The Board of Studies for the Faculty of Basic Sciences and Humanities transacted the following items :

Considered and recommended to the Academic Council for approval.

1) New course for the Major Field of specialisation for IV year standing of B.Sc. (Ag.) programme.

2) Changes in the course contents of the under-graduate degree programme.

3) Course for the new M.Sc. (Environmental Biology) degree programme.

The Board of Studies for the Faculty of Veterinary and Animal Sciences transacted the following items :

Considered and recommended to the Academic Council:

1) New regulations and syllabi for the B.V.Sc. and M.V.Sc. degree programmes.

2) Proposal to amend the procedure for calculating the attendance requirement to all the under-graduate and Post-graduate students of Madras Veterinary College.

Board of Examinations :

The Board of Examinations met six times during the year under report. The following decisions were taken.

1. Approved the question paper setters, internal and external examiners for B.Sc.(Ag.), M. V.Sc., and B. V.Sc., examiners held during April/May/June, 1975 and October/November/December, 1975. The question paper setters and examiners for the future examinations to be held during April/May/June, 1976 and October/November/December, 1976 have also been approved.

2. Reviewed, moderated and declared the results of the B. Sc.(Ag.), M. V. Sc., and B. V. Sc., degree held during (i) April/May/June, 1975 and (ii) October/November/December, 1975.

3. Approved the schemes of the University examinations for the B. Sc. (Ag.), M. V. Sc., and B. V. Sc., degrees held during (i) April/May/June, 1975 and (ii) October/November/December, 1975.

Courses and Curricula :

Thc trimester system of education is being followed for the first, second, third and fourth year standing of B. Sc. (Ag.) and B. Sc. (Hort.) B. E. (Ag.) and also for M. Sc. (Ag.), M. Sc. (Environmental Biology) and Ph. D. Programmes.

The teaching and examinations under the traditional system were followed for the final year B. Sc. (Ag.) students. In the Veterinary College. new regulations and syllabus have been introduced to first year B. V. Sc. and M. V. Sc. degree students from the academic year, 1975-76. These courses and examinations are being conducted under the traditional system.

Under the traditional syetem 8 candidates have obtained Ph. D. degree.

Student Admission :

For admission to 222 seats in the first year B. Sc. (Ag.) Class (142 at Agricultural College, Coimbatore and 80 at Agricultural College, Madurai)

there were 1316 applications. For 20 seats in the first year B. Sc. (Hort.) class there were 142 applications. Similarly for 50 seats in the first year B. E. (Ag.) class there were 727 applications.

For the post-Graduate programme for a total of 78 seats in M. Sc. (Ag.) and 5 seats in M. Sc. (Environmental Biology) there were 354 applications and for a total of 18 seats in Ph. D. there were 88 applications.

The following committees for the selection of candidates for admission to the various under-graduate and post-Graduate programmes, were appointed by the Vice-Chancellor.

B. Sc. (Ag.)	Dr. C. V. Govidaswamy Dr. T. R. Subramaniam Thiru B. Santhanakrishna Naidu
B. Sc. (Hort.)	Dr. C. V. Govindaswamy Dr. V. N. Madhava Rao Thiru B. Santhanakrishna Naidu
B. E. (Ag.)	Thiru C. R. Shanmugham Dr. Y. B. Morachan Thiru S. Jagannathan
M. Sc. (Ag.)	Dr. C. V. Govidaswamy
M. Sc. (Envi. Biol) and Ph. D.	Dr. T. R. Subramaniam Thiru K. N. Duraiswamy Respective Heads of Departments and Professors of the subject

The list of candidates recommended by the above selection committees for the various courses were approved by the Vice-Chancellor and the selected students admitted into the respective Colleges. The admissions were completed and classes commenced from September 1975 for under-Graduate classes and from August 11, 1975 for post-Graduate classes.

University Examination :

The University Examinations for B. V. Sc. and M. V. Sc. degrees were held during April/May, 1975 and results were published on June 7. 1975. The examinations for fifth and final B. V. Sc. Part II were held during July, 1975 the results of which were published on August 4, 1975. The examinations for the B. Sc. (Ag.) degree were held in May, 1975 and the results were published on June 26, 1975.

The university examinations for the supplementary students of B. V. Sc., M. V. Sc., and B. Sc. (Ag.) were held in September/October/November/December, 1975 and the results were published during October/November, 1975 and January, 1976.

Trimester system of Education:

The post-Graduates and under-Gradutes admitted during 1972–73 have entered their fourth year of study. The students admitted during the year 1973–74 and 1974-75 entered their third year and second year of the study respectively.

The second batch of 81 M. Sc. (Ag.) students and one Ph. D. student completed their degree programme during the third trimester of 1974-75. Three M. Sc. (Ag.) students have completed their degree programme during the first trimester of 1975–76. All these candidates have obtained their degrees.

In pursuance of the recommendations of the Association of Agricultural Universities, a seminar was held at the Coimbatore campus of the Tamil Nadu Agricultural University on December 31, 1975 on the "Philosophy of Education in Agricultural University". The teaching staff of all the constituent colleges attended the seminar. The discussion held centered around the (i) objectives and general aspects, (ii) curriculum and other points set forth in a questionaire from by the Association of Agricultural Universities. The seminar devoted its attention to redefine the objectives of education in the present context and how best the curricular programme could be reoriented to meet these objectives.

Research Council:

The Research Council is constituted to make the policy decision on research in various faculties of the colleges and research stations attached to the University. The Council is functioning from 1973 with the following members:

Chairman:	Vice-Chancellor	Dr. G. Rangaswami
Members:	Registrar	Thiru K. N. Duraiswamy (upto 31-8-75)
		Dr. T. R. Subramaniam (in–charge from 1-9-75 to 2-12-75) (Regular from 3–12–75)
	Deans of Colleges	Dr. T. R. Subramaniam (Dean (Agri.) (incharge upto 31-8-75)
		Dr. K. K. Krishnamoorthy (Dean (Agri.)(from 1-9-75 to 11-11-75)
		Dr. V. N. Madhava Rao (Dean (Agri.) (incharge from 12-11–75 to 31-1-76 (Regular from 1-2-76)
		Dr. C. V. Govindaswamy, Dean (Agriculture), Madurai.
		Thiru C. R. Shanmugham Dean (Engineering) in-charge upto 31-1-76) (Regular from 1-2-76)

Director of Extension Education	Dr. Y. B. Morachan (in-charge upto 11-11-75) Dr. K. K. Krishnamoorthy (from 12-11-75 to 11-12-75) Dr. S. Jayaraj (incharge from 12-12-75) (Regular from 1-2-76)
Director of Agriculture	Thiru A. Venkataraman
Director of Animal Husbandry	Dr. G. Venkatachalam (upto 31-12-75) Thiru L. M. Menzes, I. A. S. (from 7-2-76)
Director of Fisheries	Thiru M. Mayilvahanan (upto 5-2-76) Thiru R. Nagarajan (From 6-2-76)
Chief Conservator of Forests	Thiru K. A. Bhoja Shetty
Dean, Madras Veterinary College	Dr. V. Rathnasabapathy

Five members nominated by the Vice-Chancellor in rotation from among the Heads of Departments from different disciplines of the University.

1. Thiru A. Subramaniam, Professor and Head of the Department of Agricultural Botany, Coimbatore.
2. Dr. C. A. Gopalakrishnan, Professor and Head of the Department of Animal Husbandry, Coimbatore.
3. Thiru C. R. Venkataraman, Professor and Head of the Department of Soil Science and Agricultural Chemistry, Madurai.

Five experts to represent different disciplines from outside the University nominated by the Pro-Chancellor on the recommendation of the Vice-Chancellor.

1. Dr. A. Bertie D'Souza, Retired Dean, Madras Veterinary College, Madras.
2. Dr. P. Kumaraswami, Director, Institute of Hydraulics and Hydrology, Poondi.
3. Thiru A. M. Mohd. Hussain, Principal and Head of Biological Research, Southern Forest Rangers College and Research Institute, Coimbatore.
4. Thiru C. Balasubramania Mudaliar Retired Agricultural Meteorologist, Coimbatore.
5. Dr. N. Parthasarathy, Retired F. A. O. Expert, Madras.

Mamber-Secretary-Director of Research	Dr. V. N. Madhava Rao (in-charge up to 11-11-75)
	Dr. Y. B- Morachan (from 12-11-75 to 31-1-76 incharge) (Regular from 1-2-76)

The Research Council met twice (i) on June, 27 and 28, 1975 at Agricultural College and Research Institute, Madurai (ii) on January 4, 1976 at University Campus, Coimbatore.

Extension Education Council:

Chairman: Vice-Chancellor	Dr. G. Rangaswami
Members: Registrar	Thiru K. N. Duraiswamy (upto 31-8-75)
	Dr. T. R. Subramaniam (in-charge from 1-9-75 to 2-12-75) (Regular from 3-12-75)
Deans of Colleges	Dr. T. R. Subramaniam Dean (Agri). (in-charge upto 31-8-75)
	Dr. K. K. Krishnamoorthy Dean (Agri) in charge (From 1-9-75 to 11-11-75)
	Dr. V. N. Madhava Rao Dean (Agri) (incharge from 12-11-75 to 31-1-76) (Regular from 1-2-76)
	Dr. C. V. Govindaswamy Dean Agricultural College and Research Institute Madurai
	Thiru C. R. Shanmugham Dean College of Agricultural Engineering Coimbatore
Director of Research	Dr. V. N. Madhava Rao (incharge upto 11-11-75) Dr. Y. B. Morachan (incharge from 12-11-75 to 31-1-76) (Regular from 1-2-76)
Director of Agriculture	Thiru A. Venkataraman
Director of Fisheries	Thiru M. Mayilvahanan (upto 5-2-76) Thiru R. Nagarajan (from 6-2-76)

Director of Animal Husbandry	Dr. G. Venkatachalam (upto 31-12-75)
	Thiru L. M. Menzes, I. A. S, (from 7-2-76)
Chief Conservator of Forests	Thiru K. A. Boja Shetty
Dean, Madras Veterinary College	Dr. V. Rathnasabapathy

Five experts from outside the University nominated by the Pro-Chancellor on the recommendations of the Vice-Chancellor.

	Thiru M. S. P. Rajes Planter, Yercaud, Salem District
	Thiru W. P. A. R. Nagarajan, Pattiveeranpatti Madurai District
	Thiru T. V. Radhakrishnan Shaw Wallace Madras
	Thiru T. N. Palaniswamy Gounder Thudiyalur Co-operative Agricultural Services Limited Thudiyalur
	Thiru S. Nallasamy Periyar Unavu Viduthi Karur
Professors of Extension Education in Agricultural Colleges	Dr. A. John Knight Agricultural College and Research Institute Coimbatore
	Thiru M. Muthiah Agricultural College and Research Institute Madurai
Member-Secretary	Director of Extension Education Dr. Y. B. Morachan (in-charge upto 11-11-75)
	Dr. K. K. Krishnamoorthy (in-charge from 12-11-75 to 11-12-75)
	Dr. S. Jayaraj (from 12-12-75 in-charge) (from 1-2-76 Regular

Two joint meetings of the Extension Education and Research Council were held, one on 27th and 28th June, 1975 at Madurai Campus and another at Coimbatore on 4-1-76. Various extension education activities of the University were discussed and improvements suggested.

Meetings, Seminars and Workshops: During the year the University had the previlege of hosting and organising the following important meetings, seminars and workshops:

(i) 'Constructive Plan Session' of All India Seminar on role of Small Industries on implementing the Prime Minister's 20 point programme was held on October 18, 1975 and the Vice-Chancellor presided over the seminar.

(ii) The Fourth Conference of the Scheme of National Index of Agricultural Field experiments was held on November 10, 1975 and the Vice-Chancellor inaugurated the conference.

(iii) The Workshop on Coconut and Arecanut, Spices and Condiments was held during December 15th to 20th 1975.

(iv) The Workshop on the Philosophy of Under-Graduate and Post-Graduate education was held on December 31, 1975. The Vice-Chencellor presided over the Workshop.

(v) The Fifth Anual Scientific Workers Conference was held on January 2 and 3, 1976. The Vice-Chancellor presided over the functions. Dr. N. Parthasarathy, Retired F. A. O. Expert was the Chief Guest. The Conference was inaugurated on January 2, 1976 and the group diacussion followed thereafter. The plenary session was held on January 3, 1976 under the chairmanship of the Vice-Chancellor.

(vi) A two day symposium on Plant Protection Research and Development was held on February 27 and 28, 1976 and the Vice-Chancellor presided.

Visitors : A large number of dignitaries from foreign countries and from places outside the State visited the University during the period under report. A list of important visitors is given in Appendix I.

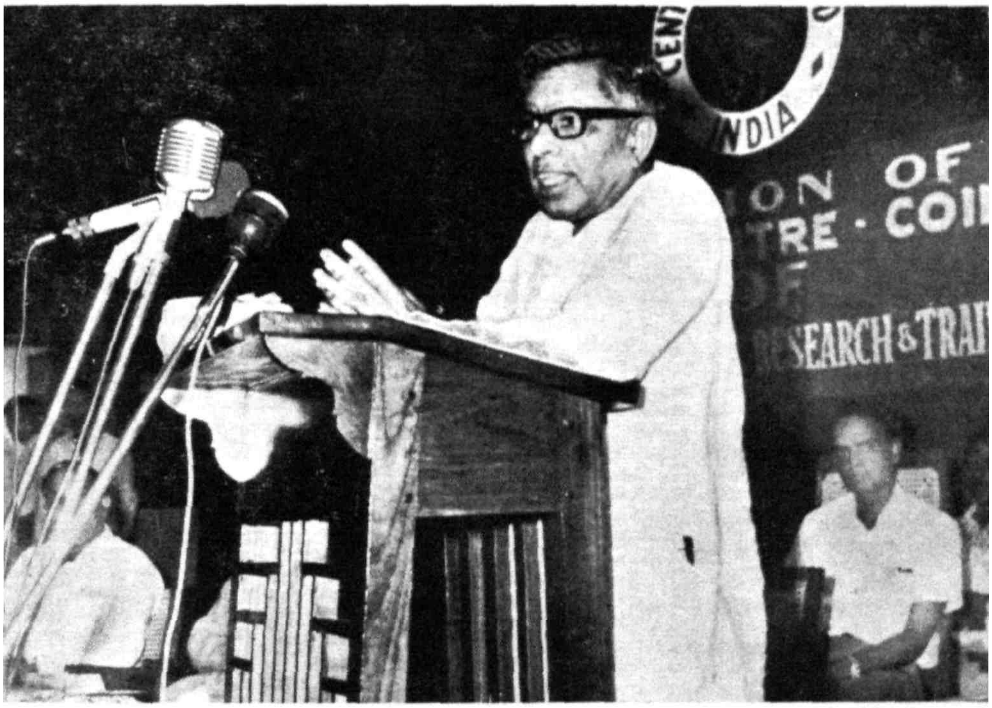
Visit of Staff Members to Foreign Countries : Dr. V. Rajagopalan, Professor and Head, Department of Agricultural Ecnomics, visited some of the leading educational institutions in United Kingdom and United States of America during April-May 1975 for finalising the procedural formalities under Inter Institutional educational programme funded by Ford grant.

Thiruvalargal S. Varadarajan, R. Sundaresan and P. Zeaudeen left for United States of America in September 1975 for advanced studies in Purdue, Oregon and Cornell Universities.

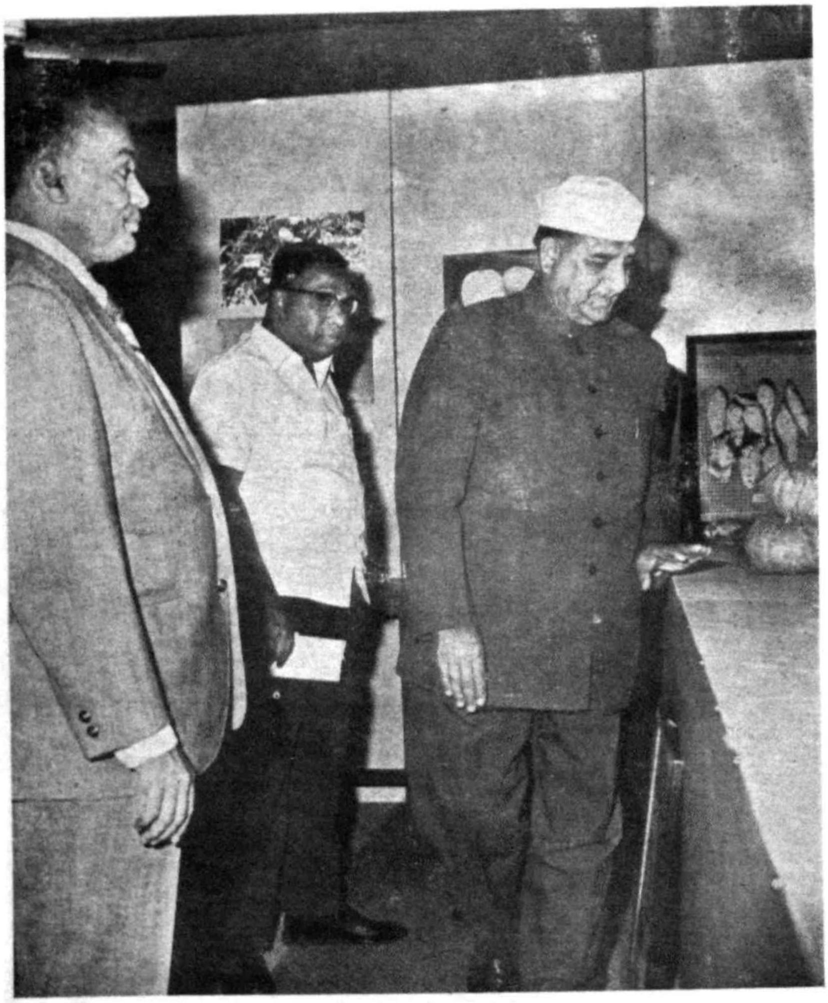
Campus Development Plans : The following amenities were provided :

Amenities for the students :

(a) Agricultural College and Research Institute, Coimbatore :



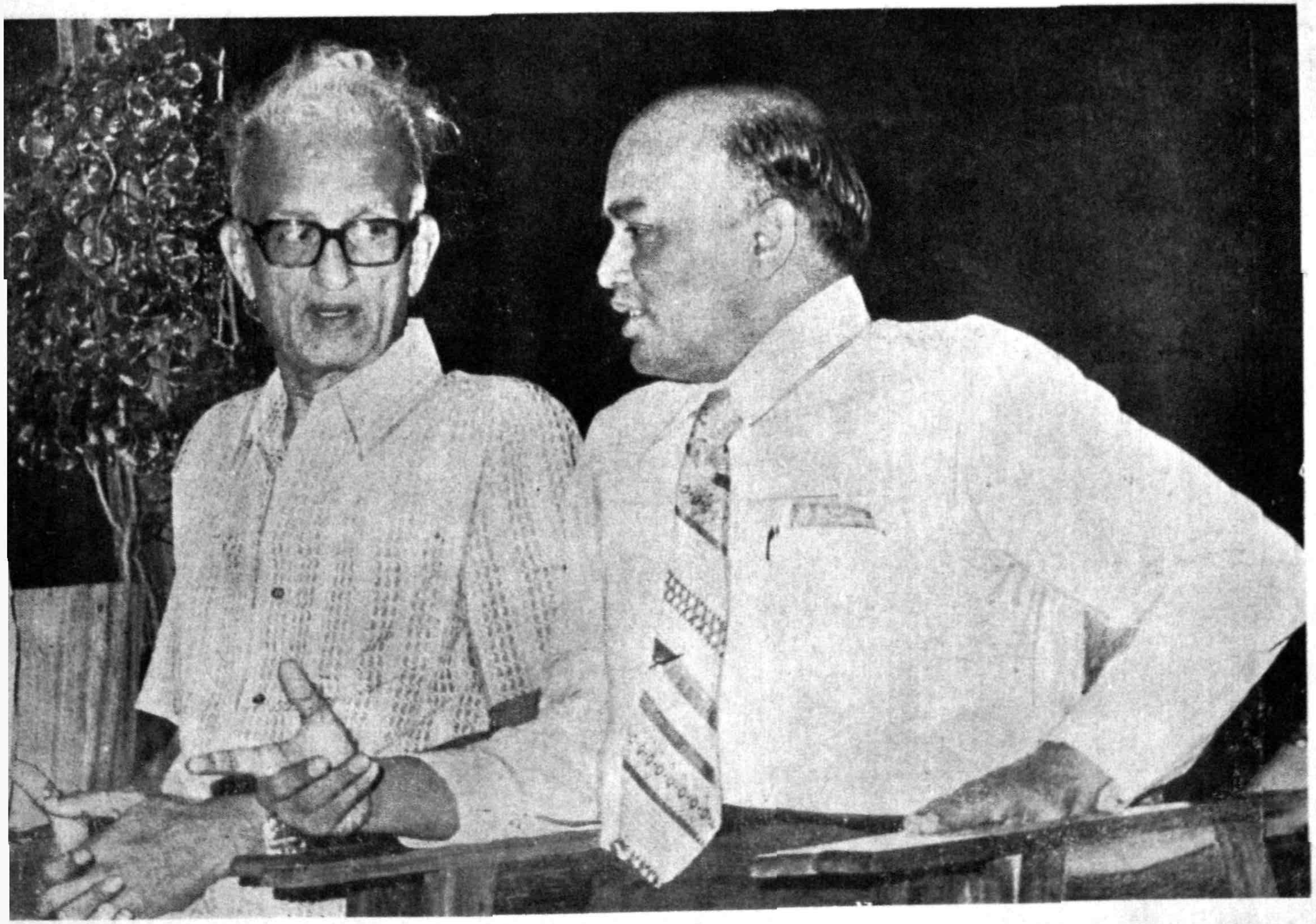
Hon'ble Shri. C. Subramaniam, Union Finance Minister inaugurating the Extension Centre of the Sericulture Research and Training Institute, Mysore at TNAU Campus, April 13, 1975,



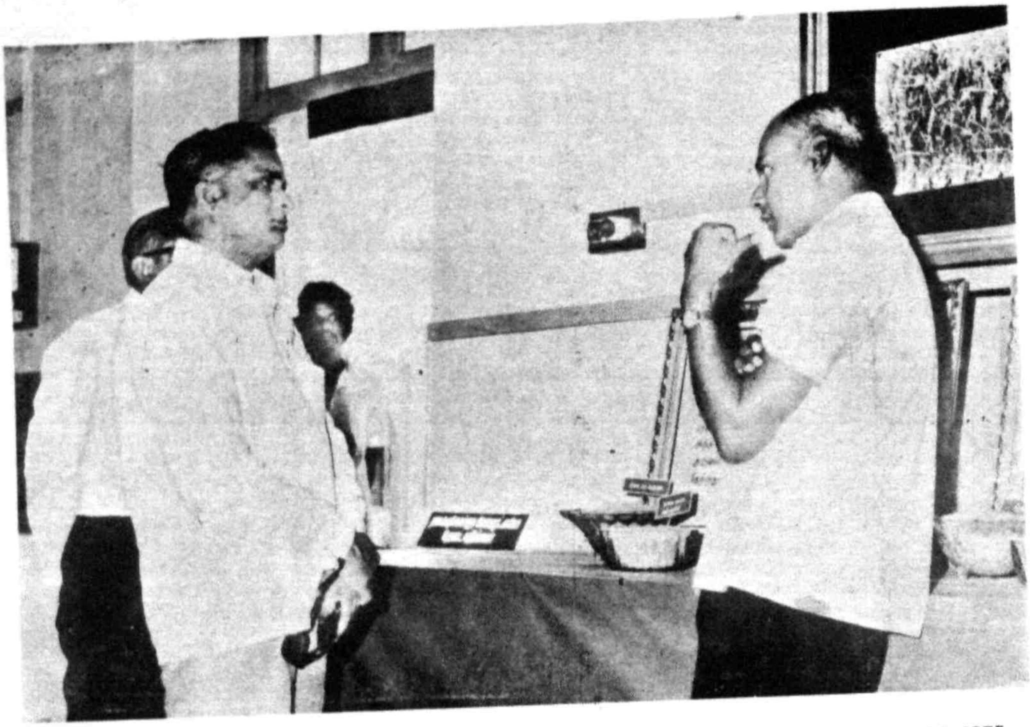
Hon'ble Shri. Shah Nawaz Khan, Minister of State for Agriculture and Irrigation, Govt. of India visiting the Main Campus, December 19, 1975.

ICAR team for assessing the requirements of Grant - in - Aid for TNAU for the V year plan period visiting the main campus, October 21, 1975

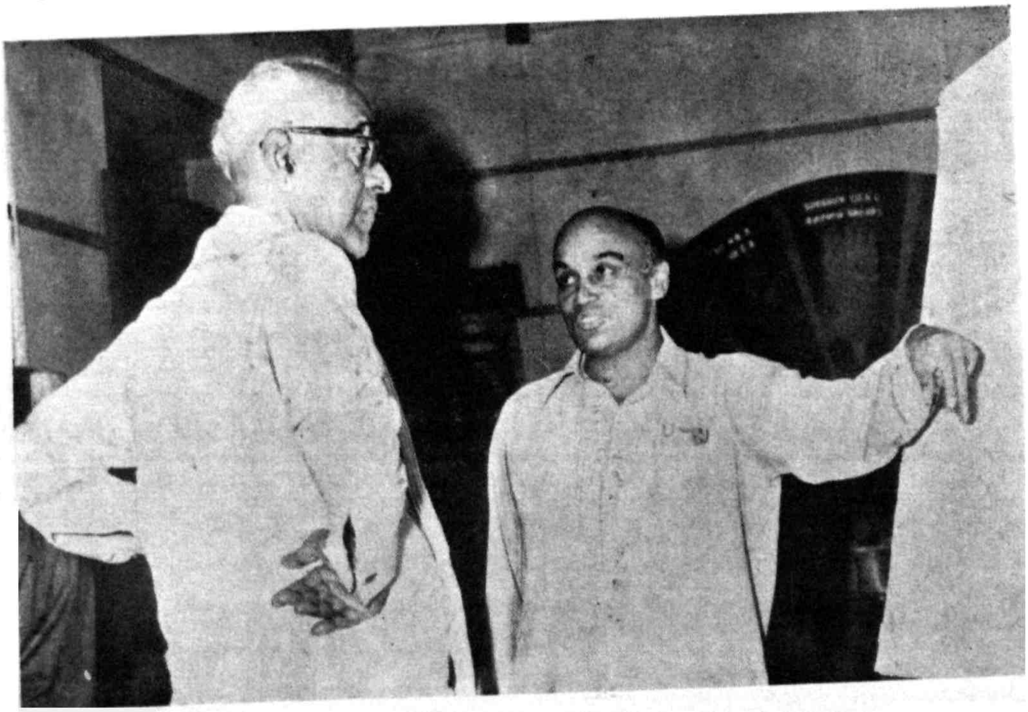
A party of 28 Foreign Army Officers and their wives visiting the main Campus, October 16, 1975.



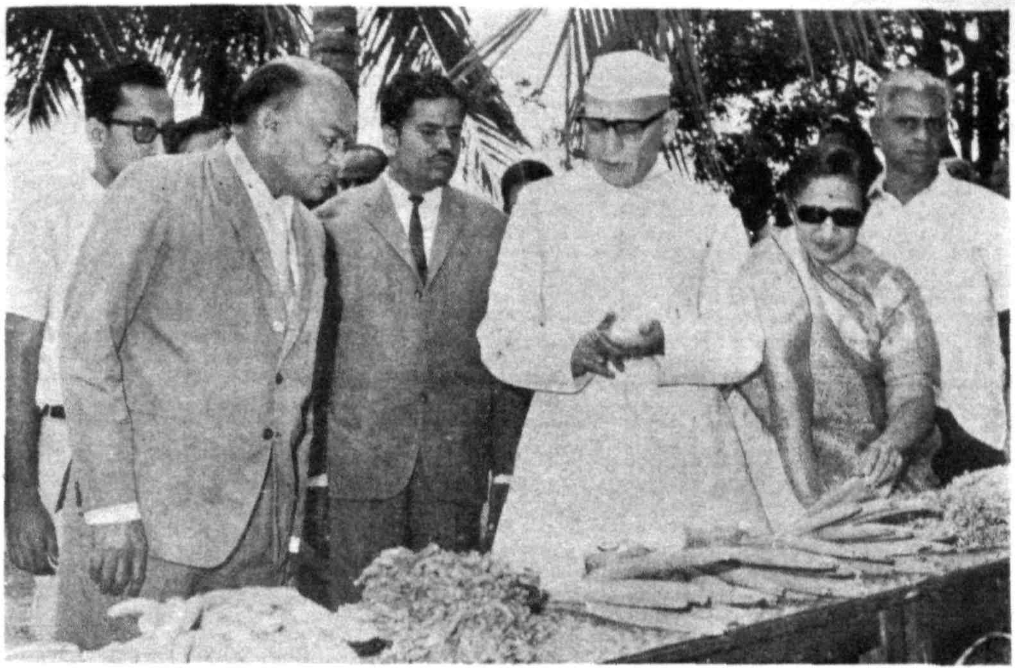
Our Vice-Chancellor with Dr. Malcolm S. Adiseshiah Vice-Chancellor, University of Madras.



Shri Charan Mathur, Minister for Agriculture Rajasthan visiting the Central Exhibition, April 23, 1975



Raja Sir A. Muthiah Chettiar visiting the Central Exhibition, June 7, 1975



His Excellency Thiru. K. K. Shah, Governor of Tamil Nadu, visiting the main campus, January 5, 1976

His Excellency Thiru. K. K. Shah, Governor of Tamil Nadu visiting
TNAU *Millet Breeding Station, January 5, 1976*

Thiru. Mohanlal Shukadia, Governor of Karnataka, visiting the Central Exhibition, September 27, 1975.

Thiru. Yeswanta Rao, Minister for Co-operation, Maharashtra, visiting the Central Exhibition, May 21, 1975.

1. Construction of swimming pool (finances partly contributed by the students)

2. Formation of bitumen roads around Post-Graduate Block, Ramasamy Sivan Block, Research Institute Building and also one feeder road from Farmers' Training Centre to Animal Nutrition Building.

3. Construction of University Library,

(b) **College of Agricultural Engineering, Coimbatore** : Construction of College of Agricultural Engineering Block.

(c) **Agricultural College and Research Institute, Madurai** : Construction of Basic Science Block.

Amenities for the staff :

1. Extension to the existing University canteen
2. Extension to the existing Tamil Nadu Agricultural University Staff club.
3. Extension to the existing Ladies club,
4. Construction of University Library (Already shown as Item No. 3 under amenities to students)

Horticultural Research, Station, Periakulam :

1. Construction of Insectary Block
2. Sinking of a borewell in the existing open well
3. Formation of roads

Horticultural Research Station, Kodaikanal :

1. Black topping of road leading to silver cascade

Agricultural Research Station, Bhavanisagar :

Construction of Instructors' quarters - Twin block two numbers.

Vice-Chancellor's Activities : The Vice-Chancellor was actively associated with the following Associations, Committees, Academic bodies and Educational activities during the period :

Honorary Colonel Commandant N. C. C. at the Tamil Nadu Agricultural University; Tamil Nadu State Advisory Committee of the N. C. C; President, Madras Agricultural Students Union; Life member and President of the Indian Society of Agricultural Chemist, Allahabad; Fellow of the Indian Acadamy of Horticultural Sciences, Bangalore; Chairman of the Research Co-ordination Committee; Achievement Audit Committee of the Central Silk Board, Bombay; Editor-in-chief, Indian Journal of Sericulture, Central Silk Board, Bombay; Member of the Current Science Association, Bangalore; Member of the Society of Biological Chemists (India); Chairman of the Scientific Panel on

Agricultural Education, Member of the General Body, Governing Body, Research Society and Standing Finance Committee, Indian Council of Agricultural Research; International Foundation for Science, Stockholm, Sweden; Member of the National Science Education Foundation, New Delhi; Member of the Advisory Committee of Vice-Chancellors, University Grants Commission, New Delhi; Secretary-Treasurer of the Indian Agriculture Universities Association; Member of the Board of Management of the Indian Agriculture Research Institute, New Delhi. During the period the Vice-Chancellor was on study tour around the world for 45 days. He visited the United States of America, Mexico, Japan, Philippines, Thailand, Malaysia and Singapore. From October 27 to November 4, 1975, the Vice-Chancellor visited Cairo to attend the Second General conference of the Association of Faculties of Agriculture in Africa. The Vice-Chancellor attended the Conference of the Executive Heads of Commonwealth Universities at Victoria University, Wellington, New Zealand. The Vice-Chancellor took active part in several Scientific meetings, academic functions and farmers meets during the year. He was also on the All India Radio on several occasions to broadcast his views on several aspects of Agriculture and Education. He has been keeping close touch with the farming community in the State through frequent visits to the field and taking part in the functions organised by the farmers.

3. TEACHING

A. AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, COIMBATORE

The Agricultural College and Research Institute, Coimbatore continued to offer B. Sc. (Ag.). B. Sc. (Hort.), M. Sc. (Ag.) and Ph. D. Courses. The supplemental final year B. Sc. (Ag.) was under old regulations while the other classes (I, II, III and IV years) operated on trimester system. Dr. T. R. Subramaniam, Head of the Department of Entomology continued to hold full additional charge of the post of the Dean, Agricultural College and Research Institute, Coimbatore upto 31-8-75. On his appointment as Registrar, Dr. K. K. Krishnamoorthy took full additional charge and continued upto 12-11-75. Dr. V. N. Madhava Rao, Head of the Department of Horticulture, Agricultural College and Research Institute, Coimbatore, took full additional charge from 12-11-75 and continued upto 31-1-76. He was posted in a regular capacity as Dean from 1-2-76 and is continuing.

Admission : The college reopened on 25-11-74 for the supplemental final year B, Sc. (Ag.) (Old regulations) classes. The II, III and final year B. Sc. (Ag.) and B. Sc. (Hort.) classes under trimester system commenced on 21-7-75. The classes for the Senior Post-graduate students commenced on 21-7-75.

The classes for the Junior Post-Graduate students commenced on 11-8-75 under the trimester system. The I B. Sc. (Ag.) and I B. Sc. (Hort,) students were admitted on 1-9-75. The number of students admitted in the I year B. Sc, (Ag.) was 142 and I B. Sc. (Hort.) 20. The strength of students during the year in different courses was as follows:

Ist year B. Sc, (Ag.) 142; I year B. Sc, (Hort.) 20; II year B. Sc. (Ag.) 141; II year B. Sc. (Hort.) 20; III year B. Sc, (Ag.) 139; III year B. Sc. (Hort.) 20; Final year B. Sc. (Ag.) 143; Final B. Sc. (Hort.) 19; and Final year B. Sc. (Ag.) Old Regulations 60 (Supplemental students). I year M. Sc. (Ag.) full-time 57; Ph. D. full time NIL and Ph. D. part-time 18. II year M. Sc. (Ag.) Full time 63; II year Ph. D. Full time 1; II year Part-time M. Sc. (Ag.) 15; II year part-time Ph. D. 30; III year M. Sc. (Ag.) Part-time 40; Ph. D. Part-time 52; Ph. D. Full-time 5; and IV year Ph. D. part-time 15.

Examinations: The University Examination for II, III and final year B. Sc. (Ag.) students under old regulations were conducted during May 1975

and October 1975. The results of the examinations held during May and October 1975 are furnished.

Class	No. of candidates appeared	No. of candidates passed	CLASS I	CLASS II	CLASS III	Percentage of passes
MAY, 1975						(percentage)
II B. Sc. (Ag.)	3	2				67.0
III B. Sc. (Ag.)	45	28				62.2
Final B.Sc. (Ag.)	151	105	25	66	14	69.5
OCTOBER, 1975						
II B. Sc. (Ag.)	1	1				100.0
III B. Sc. (Ag.)	16	10				62.5
Final year B. Sc. (Ag.)	121	83	3	17	63	68.6

Post-Graduate/1975-76

Number of candidates awarded Post-Graduate degrees

	M. Sc. (Ag.)	Ph. D.
Agricultural Botany	10	—
Agronomy	10	—
Soil Science	6	2
Entomology	9	2
Pathology	7	1
Horticulture	7	1
Agricultural Economics	8	1
Agriculturul Extension	8	—
Seed Technology	4	—

Tours: The final B. Sc. (Ag.) students went on tour from 23rd December 1975 to Ist January 1976 to Bangalore, Thirupathi and Madras and visited Research Stations and gardens

Scholarships: The details of scholarships awarded during 1975-76 are furnished below:

Name of the scholarships	Under Graduate	Post Graduate	Total
1	2	3	4
Merit scholarships	15	7	22
Borax Morarji Scholarship	—	1	1
Rallis India Scholarship	—	1	1
Scholarship under retired scientist scheme	—	1	1
Atomic Energy Scholarship	—	1	1
Hindustan Lever Scholarship	—	1	1
Backward Scholarship	266	3	269
Scheduled Caste Scholarship	71	2	73
ICAR Scholarship	65	56	121
CSIR Scholarship	—	3	3
EID Parry Merit Scholarship	3	—	3
Lodge Concord Scholarship	3	—	3
Talent Search Scholarship	1	—	1
Church of South India Scholarship	1	—	1
National Loan Scholarship	45	—	45
Harijan welfare Loan	43	—	43
National Merit Scholarship	12	—	12
Pondy Merit Scholarship	4	—	4
	529	76	605

Student's Hostel:

Staff: Dr. V. Rajagopalan, Professor and Head, Department of Agricultural Economics continued as Warden of the University Hostel. Thiru T. S. Manickam, Assistant Professor of Soil Science and Agricultural Chemistry continued as Deputy Warden (Administration and Accounts), R. Kulandaivelu Assistant Professor of Agronomy continued as Deputy Warden (Mess upto 6-8-75 and taken charge as Deputy Warden (Canteen) from 7-8-1975 Dr. S. Chellaiah, Assistant Professor of Entomology continued as Deputy Warden (Stores) upto 6-8-75 and taken charge as Deputy Warden (Mess on 7-8-1975. Dr. S. R. Subramaniam, Assistant Professor of Agricultural Economics continued as Deputy Warden (Canteen) upto 6-8-75 and taken charge as Deputy Warden (Stores) from 7-8-75. Thiru Shanmugam, Assistant professor of Agricultural Engineering took charge as Deputy Warden (Agricultural Engineering Hostel) from 25-8-75.

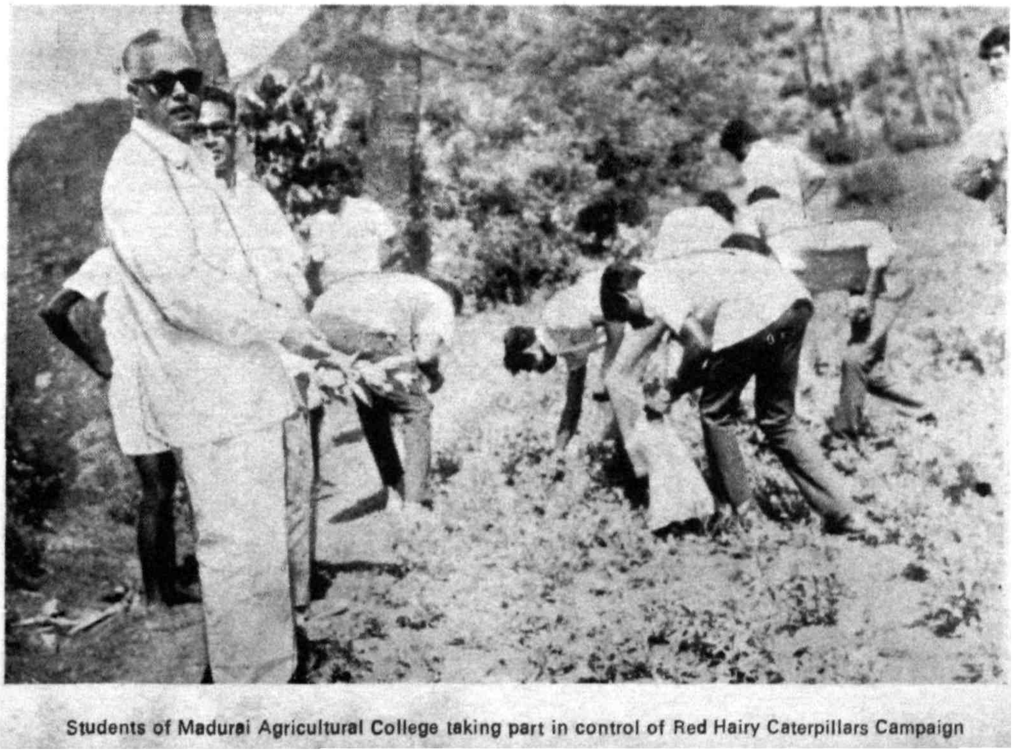
Accommodation and strength of the hostel: There were 853 students at the beginning of the year and 873 students at the end of the year and 79 students were permitted to be dayscholars during the year. Among them, there were two foreign students, The under graduates (I, II B. Sc. (Ag.), B. Sc. (Hort.) and B. E. (Agri.) were accomodated in the Old Hostel Buildings while the III year B. Sc. (Ag.), B. Sc. (Hort.) and a portion of III B. E. (Ag.) students were accommodated in the pre-professional course

hostel. The Final Year B. Sc. (Ag.) the post-graduate students were put in the New Hostel Buildings and supplementary (concurrence course) students in the Old Hostel buildings. The IV Year B. E. (Ag.) and a portion of III B. E, (Ag.) students were accomodated in the New Engineering Hostel opened from 1-9-1975. The General Health of the students continued to be normal and satisfactory. The Medical Officer newly appointed by the University continued to attend on sick students of the Hostel in the newly opened University Hospital from 1-8-1975.

Messes : Six messes were run during the year, each mess catering both vegetarian and non-vegetarian dishes separately. All the messes are provided with sufficient utencils to serve as self serving messes for students. The requirements of messes, such as mutton, fish and bakery production were continued to be purchased on limited tender system while the groceries, provisions, vegetables, etc., were obtained from the co-operative super market Chinthamani and supplied at the Hostel Premises free of transport. Fowl and eggs were supplied by the Tamil Nadu Poultry Development Corporation Ltd., Coimbatore. Milk was supplied by the Coimbatore Cooperative Milk Supply Union Ltd., Coimbatore. Students Representatives were associated in all aspects of running of messes as before. A total sum of Rs. 12,92,105/- was spent towards purchase of groceries, vegetables, milk and other items required for running of the students' messes.

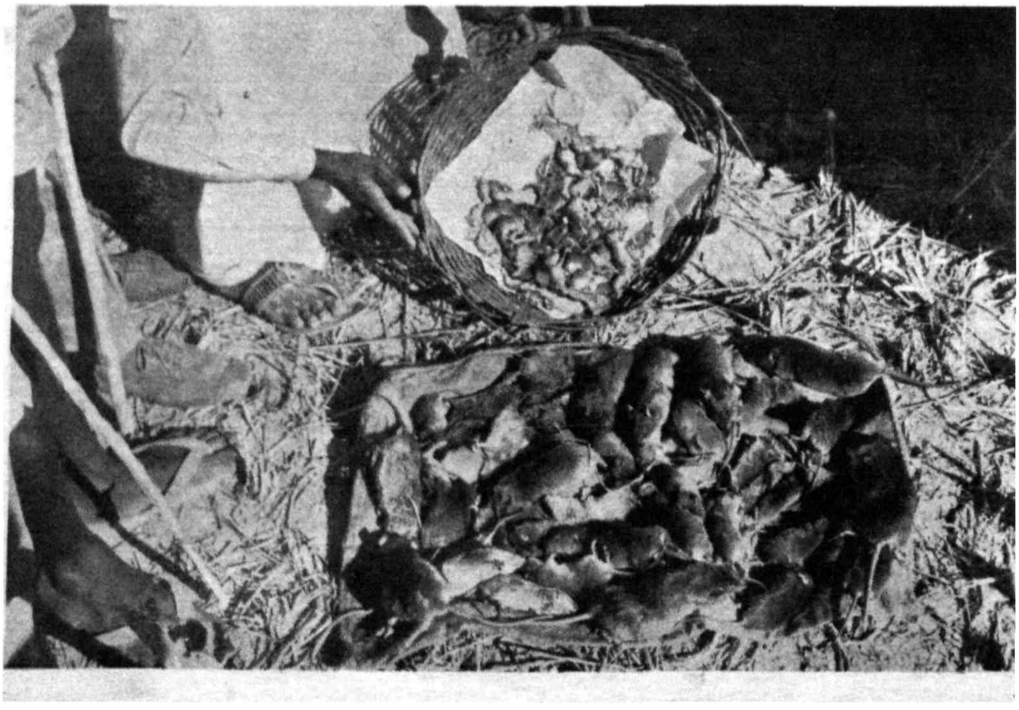
Students Club and Social Activities : The Election of the office bearers of the Students Club held on 26th January, 1975. Thiru M. Raju IV B.Sc. (Ag.) and Thiru V. P. Ramachandran respectively. IV B. Sc. (Hort.) were elected as club Secretary and games Secretary. The Independance Day was celebrated on August 15, 1975. Dr. G. Rangaswami' Vice-Chancellor, Tamil Nadu Agricultural University, took the salute of N. C. C. march past and delivered the Independance day message. The students organised the National Campaign on the Eradication of Noxious weeds on September 10, 1975 at Peelamedu, Coimbatore. Thiru K. Lakshmikanthan Bharathi, I. A. S. District Collector, Coimbatore, was the chief guest and inaugurated the campaign, while Dr. G. Rangaswami, Vice-Chancellor, Tamil Nadu Agricultural University, presided. The students gave a demonstration on the spraying of herbicides on *parthenium* weed. The inaugural function of the students' club activites for 1975-76 was held on November 5, 1975. Honourable Justice Thiru N. Krishnaswamy Reddi, Tamil Nadu High Court delivered the inaugural address; Dr. K. K. Krishnamoorthy, Dean (Ag.) (i/c) presided. The inaugural function of the Debating Society was held on November 8, 1975. Thirumathi Chandrakantha Kariali, I. A. S. and Dr. S. Balachandran, Professor, World Tamil Research Institute, Madras delivered the inaugural addresses in English and Tamil respectively. The inaugural function of the Social Service League was held on November 29, 1975. Professor S. Seethalakshmi of Home Science Extension, Avanasilingam Home Science College delivered the inau-

Students of Coimbatore Agricultural College demonstrating herbicides spraying in *Parthenium* weed, September 10, 1975.



Students of Madurai Agricultural College taking part in control of Red Hairy Caterpillars Campaign

Students Rat Control Campaign at Semmedu, Thondamuthur Block, January 22, 1976.



gural address and distuibuted the books to night school children. The Children's Day celebration was held on November 14, 1975. Thirumathi Maragatham Maruthachalam of Home Science College presided and distributed the sweets. Pongal festival was celebrated on January 14, 1976 for the night school children by the Social Service League. The inaugural function of the planning forum was held on Saturday, December 6, 1975. Thiru V. Sankarasubbaiyan, I. A. S. Special Officer, Coimbatore Municipality delivered the inaugural address.

Thiru V. Ramakrishna Memorial Cup for the best drama for Inter-collegiate competition held at C. I. T. was won by the Dramatic Society on twenty-ninth January, 1976. The best actor prize was won in the Inter collegiate dramatic competition held at G. C. T. on February 5, 1976. The Inter-collegiate debate for P. D. Karunakar cup and D. Parthasarathy cup was held on February 6 and 7, 1976 respectively. Prof. M. S. Nadar and Dr. K.K. Krishnamoorthy delivered the Special Address in English and Tamil respectively. The Annual Day Sports was held on January 3, 1976. The Inter-Agriculture sports for M. A. S. U. cup was also held on the same day. Competitors from Agricultural College, Madurai, Faculty of Agriculture, Annamalai University and University Main Campus competed for the MASU cup. The MASU cup for the total aggregate was retained by Agricultural University Main Campus by securing 33 points. Dr. G. Rangaswami, Vice-Chancellor presided over the function. Thiru L. S. Panchabakesan, Superintendent of Police delivered the special address and distributed the awards to the winners. The Republic Day was celebrated on January 26, 1976. Prof. C. R. Shanmugam, Dean, College of Agricultural Engineering hoisted the flag and delivered the Republic day message.

The Kalaimani memorial Foot-ball tournament was conducted from January 21 to 28, 1976. The P. S. G. Arts College claimed the trophy beating Government Arts College, Coimbatore on the final day. Thiru R. Rajendran of P.S.G. Tech was award the best player of the tournament. Dr. V.N. Madhava Rao, Dean (Ag.) presided over the function and distributed the awards. The Hiking Society of the Students' Club with a Contingent of 50 students visited Valaiyar Dam by cycle. Thiru S. Chandran, II M. Sc. (Ag.) participated in the Y. M.C. A. Table tennis tournament and won the Rolon trophy in the finals. The main campus hockey team won the Inter Collegeate hockey tournament beating P. S. G. Arts College in the finals on 29-8-1975. The team has entered in the Super League of the Coimbatore disrtict Hockey League by claiming maximum points in A zone. The Basket-ball, Volley Ball and Hockey teams participated in the Centenary tournaments of St. Joseph College, Trichy. Thiru D. Nandakumar II M. Sc. (Ag.) was awarded the award for the best player of the tournament in Hockey. The Cricket team participated in the District League (C. Division) and won the championship by securing 42 points. The Pentathlon competition to select 'Best Students Athlete' of the Tamil Nadu Agricultural University was held on 10-12-75, and Thiru

S. Ramaswamy III B. Sc. (Ag.) was adjudged as the 'Best Students Athlete' for Pro-Chancellor's prize.

The Inter-Collegiate Debate (Tamil Nadu Agricultural University) was held on 16-12-75 to select the 'Best Student orator' of the University and Thiru R. Vijayaraghavan IV B. Sc. (Ag.) was selected as the Best Student orator for Chief Minister's prize.

National Cadet Corps: The allotted strength of the 4 Coy 4 (TN) Bn. NCC, Coimbatore was 70 and it was increased to 100 during this year. The total strength of 100 cadets were recruited from first, second and third year courses of B. Sc. (Ag.), B. Sc. (Hort) and B. E. (Ag.). As per the syllabus, training in foot drill, weapons training, field craft, map reading and first aid was imparted for 120 periods of 35 minutes duration each. A batch of 22 selected cadets attended the combined Annual Trainining Camp at Salem for a period of 10 days from 22-12-75 to 2-1-76. Twenty five cadets appeared for the 'B' certificates and 13 cadets for certificate 'C' examination in February 1976. The Independence day parade was conducted on 15th August 1975. The Vice-Chancellor Dr. G. Rangaswami took the salute. The Republic Day parade was conducted on 26th January 1976 and Thiru C. R. Shanmugham, Dean in-charge, College of Agricultural Engineering took the salute. Guard of honour was presented to the Union Minister for Agriculture Hon'ble Jagjivan Ram on 19-2-76 on the occasion of the 4th Convocation of the Tamil Nadu Agricultural University, Coimbatore. 2/Lt. Michael Raj was in charge of the company till 17-8-75 Capt., P. K. Rangiah was posted as N. C. C. Officer with effect from 18-8-75 consequent on his transfer from Agricultural College and Research Insititute, Madurai to Coimbatore.

Entertainment: During the year 28 feature films were screened in the University Auditorium to the students, with 35 mm projector.

Library: During the year 1687 books, 787 bulletins and 82 Annual Reports were added to the library. The number of current periodicals subscribed was 556. A total number of 147 periodicals were received free. The number of books issued on loan was 49,972 and the number of bound volumes of journals issued on loan was 12493. 18,970 persons visited the library during the period under report. 95,017 books and publication were consulted in the library. Browne's Book Issue Method has been introduced in the library. Two book cards are being used for issuing each publication on loan. One book card is intended to denote the date of return and the other book card is intended for locating the information "who has taken a particular publication on loan". This new system has proved to be a time saving device, as the practice of maintaining loan register has been discontinued after the introduction of the new issue method.

One Reprographic equipment (Korestat copier) has been purchased at a cost of Rs. 25,000-00 and it has been put into use. The Assistant Librarian in charge Library was deputed to take training under M/s Kores (India) Ltd., Madras to operate the Korestat copier. The above machine is being operated under his supervision now. Reprints from Journals are being taken with the aid of this equipment,

Research by the Post-Graduate Students: The results of research carried out as part of the requirement for post-graduate degree by the students of M. Sc. (Ag.) and Ph.D. in the Agricultural College and Research Institute Coimbatore are summarised.

Agricultural Botany: Hybrid derivatives involving five early duration rice varieties were studied for their recombination potentials for earliness and grain yield. The results indicated that the cross combinations of Karuna with cultures 6914 or 6916 exhibit high promise to combine superior grain yield and earliness.

Studies on the development of male sterile lines and the effect of genome substitution in the genus Sorghum have revealed that the initial transfer of genome of the three elite maintainer lines viz., 2219B, 2077B and 3660B into male sterility inducing cytoplasmic lines of ms UZM. 2, msM.35-1, msG. 1 and msM. 31-2 can be achieved by the backcrossing programme.

A study of variability, correlation and evaluation of metric traits in *Sesamum indicum* L. in different seasons, has indicated that the degree of variation among and within the exotic and indigenous varieties varied from season to season. It was found that the number of capsules/plant, no. of locuales/plant and number and length of secondaries alone are related to grain yield.

In groundnut, investigation in certain inter-varietal crosses involving bunch types have shown the presence of positive heterosis for number of pods and pod yield. The parents Ah. 7522 and TMV. 9 were found to be better parents. It was also observed that the characters number of primaries and number of matured pods primarily be used for selection towards the improvement of yield.

Investigations on the induction of mutations in the strain CO. 2 of cowpea with different doses of gamma rays and EMS have most effective and efficient in inducing both chlorophyll and viable mutations. An assessment of the induced variability in the different meteric traits indicated differential response both in terms of the mutagen and the dosage.

Similar studies in two varieties of greeen gram showed that gamma rays and EMS differed in their mutagenic action and spectra and varietal differences also existed for the responsiveness to the mutagens, only PLS. 367/2 producing plant type mutants, seed colour mutants, and cobed mutants.

In Lab-lab, variety CO. 6, it was found that for obtaining higher segregation ratios, gamma irradiation of pre-soaked seeds may be more advan-

tageous than treating with EMS. In general, single mutations were more frequent than multiple mutations. A large number of viable mutants over a wide range of characters were isolated.

Studies carried out on the yield components in turmeric have brought out that specific improvement directed towards the number of leaves in the main shoot, leaf length and width' number of rounds and secondary fingers would result in increased yield.

Studies on resistance to *verticillium* wilt in cotton confirmed the intrinsic value of *G. barbadense* as a source of resistance. Variety Sujata was found to be highly resistant. In studying the chemical factors for resistance to *verticillium* wilt, it was observed that the potash content of Sujata was uniformly high as compared with the low potash content of the susceptible varieties, 5904-E and MCU-1. The potash content of the resistant F1 hybrid (Sujata x MCU-1) was intermediate between the parents, thereby indicating that the chemical factor for resistance has been fully in operation in the hybrid.

Agronomy: For IR 20 rice, application of 200 kg N/ha in four splits as basal, 23rd, 46th and 70th day after planting recorded an yield of 6851 and *6201 kg/ha of grain during summer and kharif seasons respectively.* Under moderate fertility level the application of 50 kg N/ha in two doses one at tillering and the other at panicle initiation gave an yield of 3481 and 4520 kg/ha of grain during 1974 and 1975 indicating more efficient use of applied nitrogen at thisfertility level.

CSH. 5 cholam during summer season gave the maximum yield of 7202 kg grain for the application of 150 kg/ha in 8 splits. while in *kharif* it gave 7412 kg/ha with five splits.

In maize Ganga 5 application of nitrogen in four splits as basal, 20th, 45th and 60 th day after sowing at the percentage of 50:20:15:15 gave a maximum yield of 3644 kg/ha of grain. The ratio of nutrients removed were in the ratio of 1:0.19:0.68 of N P and K. Ploughing once with mould board plough (minimal tillage) combined with atrazine at 0.25 kg a.i/ha as pre-emergence band application on tne seed row gave a grain yield of 5132 kg/ha in maize Deccan hybrid. The yield under minimal tillage was 7% higher than conventional tillage (4803 kg/ha)

In Co.10 *ragi*, maximum grain yield of 4506 kg/ha was obtained for the application of 60 kgN/ha applied in four splits at transplanting 17th, 34th and 50th day after planting. The crop nutrients removed were in the ratio of 5:1:8 of NPK.

In HB. 3 cumbu during summer and monsoon season a grain yield of 2800 and 2535 kg/ha were obtained respectively for the application of 75 kg/N/ha in 3 splits at 25th, 40th and 55th day after sowing. The economic dose seemed to be 50 kg N/ha.

Spraying CCC at the beginning of flowering with a concentration of 20 ppm was the most beneficial to the winter irrigated cotton MCU 5. Early or late spraying were deterimental to seed cotton yield. Application of Fluomettron (cotoron) at 1.5 kg/ha on MCU. 5 gave an yield 2102 kg of seed cotton/ha which was on par with two hand hoeing and weedings (2063 kg/ha). The cost of weeding was reduced by Rs. 160/ha. The herbicide left no phytotoxic effect on the succeeding crops of sorghum, ragi, cowpea and lab lab grown as test crops.

Soil Science and Agricultural Chemistry: A study on the characteristics of soil organic matter and its fraction in hill soils of Tamil Nadu indicated that these are rich in organic matter, total nitrogen, phosphorus, lignin, protein and different humus fractions. Fifty percent of total sulphur was organic in nature and only 33% of total phosphorus was in the organic form. Detailed analysis had shown that in the organic matter fraction, humic acid was mainly. made up of phenolic and benzene carboxylic acids.

A study on the phosphate adsorption in major soil groups of Tamil-Nadu has shown that P adsorption was rapid in the initial phase and decreased with equilibration time. Phosphate adsorption increased with increasing content of clay, silt, sesquioxides and free Fe_2O_3 and decreased with decrease in soil pH. Study on the fractionation of adsorbed P indicated that the recovery of adsorbed P was in the order of A1-P> Fe-P> Ca-P in red, alluvial and laterite soils, while it was A1-P> Ca-P>Fe-P in black soils.

The effect of potassium on nitrogen nutrition in rice IR 20 has shown that K application did not have any significant effect on the available N content in soil and yield of grain. Increased K application caused a decline in the ammoniacal N content. A field experiment conducted with five levels of N (O, 70, 140, 210, and 280kg/ha) on sorghum variety CSV. 4 revealed that maximum yield of grain (6448 kg/ha) was obtainned by the application of N at 143 kg/ha. Beyond the level of 140 kg/ha, there was a reduction in the yiele of grain, whereas increased application of N upto 280 kg/ha increased the straw yield. Application of N increased the content and uptake of N, P, K and Mg in plants.

A study on the methods to reduce the water and nutrient losses and to increase the fertilizer use efficiency in a highly permeable soil has indicated that water holding capacity, porosity and volume expansion on wetting were favourably influenced by the addition of clay and organic matter. Available N, P and K content of the soil was also increased by the combined application of clay and organic matter. Addition of industrial wastes like fly ash, flue dust and cement dust reduced the loss of N, P, K, Ca and Mg in the leachate water.

Boron application had a significant influence on the availability of nutrients like N, P, Ca and B in soils, Total amino acid content of groundnut

was increased by boron application but soil content, acid value and iodine value were not influenced. A study on the influence of pesticides, like aldicarp, carbofuran, di-syston and phorate on the soil nutrients and uptake by plants indicated that availability of ammoniacal N, P and S was more in the laterite soils treated with pesticides. The addition of fertilizers with pesticides increased the availability of N, P and S.

A study on plant root exudates of *zea mays*, *Cicer arietinum* and *Cossypium hirsutum* on the soil properties indicated that the plant species differed significantly in their ability to influence the soil properties. The combined effect of root exudates and rhizosphere microflora was more effective in increasing the availability of plant nutrients like P, K, Ca, Mg, Fe, Cu and Zn. Though root exudates contributed to a considerable extent in improving different physical properties, the influence of microbial population was well established for creating favourable physico-chemical micro environment around roots.

Entomology : The jassid resistant variety HB 69 cotton had high non-preference and antibiotic effects as compared to the tolerant GS 23 and susceptible PRS 72 varieties. Biochemically, the resistant HB 69 variety had high amount of carbohydrate, phosphorus and pottassium but low amount organic acids, nitrogen, calcium and magnesium. Pratylenchus delattrei multiplied well in black sandy clay loam and brown sandy loam than red sandy loam. The nematode was found pathogenic to maize in red sandy loam and brown sandy loam. Brown or black lesions on the epidermis were caused by the nematode in maize roots with extensive damage to the critical region. A positive correlation between initial population level of 1, 2 and 4 nematodes/5 g of soil and final population existed in red sandy loam and a curvilinear relationship was found in black sandy clay loam and brown sandy loam. Aldicarb at 2.5 kg/ha, applied at the time of sowing effectively controlled the nematode on maize Ganga-5.

No resistance to the shootfly was found in the 125 sorghum lines screened. Seed treatment with carbofuran, disulfoton and methomyl at 5% protected the crop effectively. Phorate + disulfoton (0.9 + 0.9 kg/ha) applied at the time of sowing also gave good control of the pest and increased the yield significantly. Three sprayings of either phosalone 0.375 kg/ha or endosulfan 0.525 kg/ha or diazinon 0.250 kg/ha or formothion 0.313 kg/ha, given at weekly intervals starting from a week after germination also protected the crop from the shootfly.

Investigations carried out on the relative efficacy of the insecticide malathion, and four plant products viz., neem kernel, *Adhatoda vasica* leaves, *Acacia concinna* (Shikai) and *Sapindus trifoliatus* ('Soapnut') as seed mixtures at three concentrations viz., 0.5, 1.0 and 2.0 per cent in protecting rice grains from the damage by angoumois grain moth, *Sitotrage cerealella* and the lesser

grain borer, *Rhizopertha dominica* indicated that malathion, neem and adhatoda were effective against *S. cerealella* at 1.0 and 2.0 per cent concentrations for six months. While *R. dominica* was effectively checked even at 1.0 per cent concentration of malathion and neem, the other plant products brought about effective check only at 2.0 per cent concentration. Treatment with activated clay exerted a good protection to the seeds from insect damage. Concentrations of 1.0 and 2.0 per cent offered relatively better protection than at 0.5 per cent, from insect damage.

The two organotin compounds, triphenyltin acetate (TTA) (Brestan-60% W. P) and triphenyltin hydroxide (TTH) (Du-Ter-20%) were tested for their antifeeding properties against three species of lepidopterous larvae and proved to be very effective at 0.06 per cent (a. i.), completely inhibiting feeding on the treated foliage.

Plant Pathology : Rice varieties, Co. 20 and T (N) 1 were resistant to the disease. Excess or deficiency of nitrogen increased susceptibility of the plants, Two grass weeds, *Echinochloa colonum* and *Paspalidium puctatum* were found to be alternative hosts for the pathogen, *H. oryzae*.

Brinjal mosaic virus was found to be transmitted through sap and graft only. This virus infected only plants belonging to solanaceae and laguminosae. The virus was identified as a strain of brinjal severe mosaic virus (BSMV). Viral infection caused a reduction in photosynthetic pigments, reducing sugars, starch and aminoacid contents and induced increases in the phenolics, total sugars, protein and non-protein nitrogen content. Brinjal plants affected by little leaf disease showed increases in respiration and starch, sugars, phenolics, copper, manganese and magnesium contents and decreases in photosynthetic rate and phosphorous, potassium, iron and zinc contents.

Weeds were found to harbour eight viruses which could infect Amaranthus, chilli, tomato and bhendi. Several species of weeds served as natural hosts for the aphids and whiteflies which transmit various virus diseases.

Three mutants each of paddy straw mushrooms, *Volvariella esculenta* and *V. diplasia* were produced by X-ray irradiation. These mutants were less productive. Quick growth of the spawn was obtained by incubation at 35°C. Horse dung compost was the best medium for the spawn production. Appilcation of tapioca starch (50 gm) or horse gram dhal (50 gm) or zinc sulphate (70 mg) in straw beds of 10 kg increased the mushroom yield. Tall, hand thrashed and rigid straws give increased yield than dwarf, cattle thrashed and soft straw.

Horticulture : Growth and development of Co. 2 papaya fruits revealed that the fruit took 137 days from pollination to maturity. Fruit growth in respect of weight, volume, length and breadth showed a single sigmoid pattern. Highly significant correlations were established between seed weight and fruit

weight, fruit volume, fruit breadth and cavity breadth and between seed number and the above characters.

In another study, the effect of spacing and defoliation on Co. 2 papaya was evaluated for growth, sex expression, flowering, yield and quality of fruits and papain content. Wider spacing and defoliation decreased the height of plants. Higher fruit set and proteolytic activity of papain were recorded in widely spaced and non-defoliated trees. However, quality of fruits was improved by the wider spacing and defoliation. Defoliation induced maleness, affected the fruit set, reduced the fruit size, seed content and the total phenolics content of the leaves.

Investigations on the seasonal variation in the physico-chemical characteristics of Co. 1 papaya revealed that low hours of sunshine, high rainfall, high humidity and low temperature prevailing between September and April were found to promote most of the physical characters of the fruits and chemical constituents such as acidity, ascorbic acid, ash, calcium and pectin.

A study on the effect of number of functional leaves in 'Poovan' banana revealed that the plants maintained with all leaves were vigorous followed by the plants with 15 and 18 leaves. The number of unemerged leaves inside the pseudostem was constant.

Lower number of functional leaves delayed flower bud initiation. Early shooting and maturity of the bunches were observed with higher number of functional leaves. The weight of the bunch was increased with increased number of functional leaves. Maintaining 12-18 functional leaves was found optimum.

Agricultural Economics: A study on resource use efficiency pattern was undertaken to determine the optimal plan with existing resources. Programmes were run for three farming situations. 1. garden land farms, 2. garden and dry lands with the size of 7.79 acres and below and 3. dry lands with more than 7.79 acres. With the information on resourse avilability, technological matrix and net value products, the liner programming problems were formulated and solved through simplex method. Data were gathered from 120 farmers spread over ten villages. The study revealed that net income has increased by 61.27 per cent, 57.99 per cent and 24.15 per cent respectively, over the existing plan. The increase in labour utilisation over the existing plan is 26.48 per cent, 19.64 per cent and 4.71 per cent respectively. The availability of capital is found to restrict the cultivation of crops like grapes, sugarcane and banana. Water, constraints intensity of cropping and considerable extent of land is left fallow during February to August.

One hundred farm holdings distributed equally among ten villages were contacted for the study on pattern of financing agriculture in Dindigul division.

The study aimed to estimate the demand for and supply of farm credit, credit gap, cost of credit and problems in supply of credit. The per hectare credit requirement was estimated to be Rs. 552.71, Rs. 297.08, and Rs. 760.26 for short, medium and long term respectively. Of the total credit supply 40.59 per cent went to cultivation purposes, 20.23 per cent for digging wells, 11.28 per cent for deepening wells and 10.20 per cent for purchase of pumpset. The per hectare credit supply was highest for short-term credit (45.05 per cent) followed by long-term (37.62 per cent) and medium-term credit (17.33 per cent). Larger farms received a large supply of 54.67 per cent of the total leaving 45.33 per cent to small farms. Private agencies have supplied 33.28 per cent of total credit supply followed by co-operatives (32.44 per cent) and land Development bank (29.44 per cent). The contribution by commercial banks was very negligible. The credit gap was 68.53 per cent, 60.05 per cent and 50,06 per cent for long, medium and short-term credit respectively. The high cost of credit was Rs. 36.00, Rs. 22.93 and Rs. 20.99 per hundred rupees of short-term credit for private credit, commercial bank loans and co-operative loans respectively, and delay in sanction of loans were identified as major problems in financing of farmers.

Study on factor markets-fertilisers and chemicals was carried out in Dindigul division with the objective of studying the market structure, to estimate the gap in fertilisers and chemicals use, to study the efficiency in marketing and use of fertilisers and chemicals, and to identify the problems faced by the farmers. For this purpose 60 farm holdings and 32 dealers in fertilisers and chemicals were interviewed. The average size of the farm was found to be 8.61 acres comprising mainly of garden and dry lands. The intensity of cropping ranged from 106.98 per cent to 147.46 per cent. A feature noticed in the study area was that as the area irrigated increased the area under commercial crops decreased. The per acre expenditure on fertiliser ranged between Rs. 73.04 to Rs. 351.27. Farmers of this area used fertiliser for dry commercial crops also. The expenditure on chemicals per acre of cropped area ranged between Rs.12.87 to Rs. 36.26. In the sample area the average fertiliser consumption was 11.7 kg of nitrogen, 4.8 kg of phosphorus and 3.2 kg of potassium per acre. Farmers preferred distribution of fertilisers in their own villages through co-operatives.

A study on the pattern of investment on the farm, to estimate the investment capecity of the farmers, and to evaluate the investment efficiency, consumption and saving, one hundred and twenty farmers were selected for the study. The average size of the holding was 10.11 acres. Rice followed by cholam or groundnut was the predominant cropping pattern. The average savings for the region was Rs. 480.83 per family and the marginal propensity to save was 0.4259. The main investment item in the study area was 24.77

per cent on livestock followed by 20.04 per cent on land, 6.68 per cent on land improvement, 18.66 per cent on liquid assets, 10.23 per cent on machineries and equipments, 8.35 per cent on building and 7.12 per cent on deepening of wells. Fifty five per cent of the circulating capital investment was for cultivation expenses followed by investment on livestock maintenance (27.87 per cent) and on attached labour (14.23 per cent). The average investment capacity of sample households was Rs. 4754.03. The investment was proportional to net cash income.

Study on economics of production and marketing of grapes was conducted to estimate the cost of production of grapes, to study the resource use, market structure, and price spread of grapes. The study covered 60 grape farms and fruit markets in selected area of the region. The average size of grape-vine-yard was 0.73 acres. The establishment cost upto the bearing stage worked out to Rs. 8082.06 per acre. The cost of production per kg. of Panneer Drakshai was Rs. 0.52. This included 37.55 per cent of establishment cost and 46.77 per cent of maintenance cost The input-output ratio for the third year vine-yard was 1:4. The average yield recorded per acre for a third year vine-yard was 5727 kg. The farmer who sold the grape in the wholesale market at Dindigul received 53.33 per cent and Madurai 59.59 per cent of consumers' price. Better organisation of producers and building of adequate market facilities may reduce the share of commission agents and wholesalers.

Study on energy use pattern in agriculture was conducted in Dindigul division to assess the energy requirement of crops with present and optimum cropping pattern, to compare the unit cost of different sources of energy and the extent of substitution, and to study the impact of energy crisis on the cost structure of farms with 80 respondents. The farms were categorised as bullock farms with mhote irrigation utilises 65 per cent bullock energy bullock farms with electric motors and oil engines, and tractor farms depends 95 per cent on tractor power. Tractor farms specialised in raising sugarcane, banana and cotton and devoted larger proportion of area to high yielding varieties. The energy requirement was maximum for sugarcane followed by banana. It was of the order of 1789, 3761 H. P. hours and 3970 H. P. hours for sugarcane for the three categories of farms respectively. Among food crops, energy requirement was more (2101 H. P. hours) for high yielding varieties of paddy. Irrigation, preparatory cultivation, harvest and transport were major operations which accounted for major share of the energy consumed. There is scope for better energy management through programming. The cost for H.P.hour of energy was Rs.0.16 for electric motor, Rs.0.35 for tractor energy, Rs. 0.49 for oil engine, Rs. 1.88 for bullock power and Rs. 4.00 for human energy. In periods of energy crisis, it would be worthwhile exploring the possibilities of assisting small farmer group with oil engines on custom hiring basis to help them to continue their farm activities.

With the aim of studying the types of land tenure prevailed the owner-tenant relationship, conditions of tenant farms, farming efficiency under different tenurial status, and to identify the causes of differences, the study on relative efficiency of owner, tenant and owner-cum-tenant operated farms was carriedout. One hundred and twenty farms at the rate of 40 under each of the above three tenurial systems were selected. The average size of the farm was 1.70 hectares and it was more in owner farms followed by owner-cum-tenant and tenant farms. There did not exist significant differences in cropping intensity. The tenant farms dispensed with permanent labour. The total cost of cultivation per hectare worked out to Rs. 2284, Rs. 2075 and Rs. 1815 for owner, owner-cum tenant, and tenant farms respectively. The average gross income per hectare was of the order of Rs. 3698, Rs. 3189 and Rs. 2888 respectively for the above three groups of farms. The over all input-output ratio was 1.67 for owner farms, 1.57 for owner-cum-ten ant farms and 1.59 for tenant farms. The tenants could not invest more possibly due to insecurity of tenure. The provisions of existing tenency laws may be strictly enforced to enable the tenants to mobilise more credit and improve their income level.

One hundred and twenty labour households were interviewed to estimate employment, unemployment, consumption pattern of agricultural labour and determine the minimum wages. The percentage of working adults per family ranged between 66.7 to 82.8. Out of the total number of persons employed, 35.8 per cent got employment for 201 to 250 days, 34.2 per cent for 251 to 300 days, 15 per cent for 151 to 200 days and 12 per cent above 300 days per year. The level of employment depends on area under irrigation, location, cropping pattern and work force of the village. The marginal propensity to consume was of the order of 0.41 and 0.48 for small and large families respectively. The per capita income and expenditure varied between Rs. 402 to Rs. 580 and Rs. 412 to Rs. 586 respectively. Nearly 85 per cent of the expenditure was on food. As per the minimum standard of living for the agricultural labourers, the average annual expenditure worked out to Rs. 814 per capita per year. The present level of income is Rs. 685 and Rs. 541 respectively for the small and large families. The minimum requirement could be achieved by either increasing the wage rate or employment level.

Agricultural Extension : A study on the beneficiaries of Nationalised Bank revealed that the commercial bank had met the credit requirements of farmers to the extent of 75 per cent in purchasing seeds, fertilizers, pesticides and in meeting cultivation expenses. The bank extended credit more to farmers with small sized holding when compared to other money lending institutions. The advantages experienced by the beneficiaries of commercial bank

included timely supply of inputs, low interest rate, availability of technical advice, absence of any extra expenditure, relatively quick sanctioning of loan and availability of credit for all the seasons.

The key-communicators to whom farmers look for opinion and information about new farm ideas were characterised by the higher level of education, higher economic status, more contact with extension agency, lower extent of fatalism, more progressivism, higher extent of venture-someness, more cosmopoliteness, higher educational aspirations for daughters and more credit orientation. The opinion leaders in villages were having moderate exposure to mass media and other channels of communication besides moderate contact with change agents. Majority of the leaders were approached by farmers for advice and guidance on farm practices. But the extension agents had not made full use of them in dissemination of agricultural technology.

In the study on the communication behaviour of small farmers of progressive and non-progressive villages, awareness and adoption of improved practices among small farmers were more in progressive village than in less progressive village. At the adoption stage, Village Level Worker, Deputy Agricultural Officers and Campaign were utilised in the progressive village, and neighbours, friends, Village Level Worker and relatives in the less progressive village were mostly utilized. The study on the poultry farmers indicated that among the major sources of information for scientific poultry farming, mass media accounted for 73 per cent, Government sources 14 per cent and neighbourhood sources 13 per cent. When the education level of poultry farmers increased, preferences were more towards mass media and specialists.

In a study on the factors associated with the efficiency of Deputy Agricultural Officers, the more efficient officers were all professional graduates with high tenure of service, either approved probationers or confirmed. In-service training undergone had also contributed to their efficiency. The more efficient Deputy Agricultural Officer had ability to write popular articles. Most of them were in the age of group of 31 and above and married. The study on the training needs of Veterinary Assistant Surgeons revealed that preferance for a comprehensive training in all the three areas viz., Veterinary Science, livestock Production and Extension Education rather than in any one specific area. They wanted training which would import both problem oriented, theoretical knowledge and practical skill.

The analysis of agricultural news content in the Tamil dailies Dinamani and Malai Murasu had shown that only less than 3 per cent of the total space of these papers covered agricultural news. The main sources for the agricultural news were Correspondents, Ministers, Commercial firms, and Central and State officials. The news articles published were found to be in relation to crop cultivation.

Seed Technology : MCU 5 cotton seeds collected picking wise from the first five pickings were studied for quality after delinting with concentrated sulphuric acid. The average loss in weight of the seeds due to acid delinting was 11 per cent and the mean recovery of quality seeds was 79.9 per cent. The 1000-seed weight was more in seeds from the first three pickings than from the later pickings and exhibited high values for embryo to seed coat ratio. The recovery of quality seeds was more from the first three pickings and exhibited better germination, dry matter production and root length and other vigour indices were more from these seeds. They were more tolerent to the accelerated ageing process. The electrical conductivity was the lowest in them, while the free fatty acid content was comparatively low. Storage studies conducted with acid delinted seeds dried to 8 per cent moisture content under ambient conditions of temperature and relative humidity for a period of 10 months indicated the following : (i) seed stored in cloth bags without seed treatment absorbed moisture gradually over the period of storage and infested by insects while those stored in aluminium foil pouches maintained the original moisture level; (ii) germination percentage and field emergence potential declined with periods of storage; and (iii) seeds treated with Captan and Thiram recorded higher germination and field emergence than the untreated ones.

Investigations were carried out to understand the relative role of temperature and relative humidity prevailing inside the crop canopy during development and maturation of MCU 7 cotton seeds. For this, a bulk crop of MCU 7 was raised under two soil moisture conditions viz., irrigating the field to field capacity when the soil moisture reduces to 80% (Unit I), and 20% (Unit 2). Further, the crop canopy was divided into two zones viz., zone I (lower half) and Zone II (upper half). The results obtained revealed the following : (i) the mean per cent germination of seed from unit 1 was 59 and of that from unit 2 was 67. Germination of seed from the lower zone was 55 per cent for unit 1 and 62 for unit 2 and that for seed from the upper zone of these units was 69 and 77 per cent, respectively. The range between the highest and lowest values was 34 per cent in unit 1 and 30 per cent in unit 2. Seed of the first picking from the lower zone recorded the lowest germination of 36 per cent in unit 1 and 50 in unit 2; and, ofthe fifth in unit 1 and fourth in unit 2 from the upper zone recorded the highest of 70 and 80 per cent, respectively. (ii) the seeds that were obtained picking-wise from plants grown in plots with a soil moisture ranging from 80 to 100 per cent, showed significant differences for quality among pickings, the poorest from the first picking closely followed by the last two pickings. The seed quality assessments with seeds obtained from zones and pickings through field emergence, speed of germination, germination after accelerated ageing, free fatty acid content, membrane permeability and rate of respiration were in agreement with the quality of seeds as measured through standard germination tests.

Seeds of Sorghum culture 771 with 7.63 per cent moisture content after treating separately with Thiram, Thiram + DDT, Thiram + Neem oil, Thiram + Nuvan and the seeds of HB3 Bajra and Ganga 5 maize hybrid with 9.8 and 8.7 moisture percent treated with Captan+DDT were packed in gada cloth bag, double packet of 300 gauge polythene bag, paper-aluminium foil-polythene laminated bag, paper polythene laminated bag and stored at room temperature. The investigations carried out with the stored seed of the above three crop varieties after a storage period of nine months indicated the following: (i) seeds stored in cloth bags recorded high moisture content (ii) a significant negative correlation was observed between seed moisture and viability, (iii) moisture-vapour proof container was found to be superior for storage of these seeds; (iv) viability of treated seeds was significantly higher than the untreated seeds; (v) fungicides either alone or in combination with insecticides were significantly better in influencing the germinability of the seeds by controlling mould invasion, (vi) Nuvan was found to be unsuitable since it exerted a negative influence by causing deleterious effects on the viability; (vii) in bajra and maize, Captan+DDT treatment has completely eliminated the infestation by *Tribolium castaneum* and *Sitophilus oryzae* (viii) X- radiographic testing of the seeds agreed well with germination values by standard methods and (ix) the results of testing for lysine of stored seed agreed very well with conventional tetrazolium ratings.

Investigations to understand the inter-relationship of seed size with physico-chemical, physiological and agronomic attributes, carried out with two bunch varieties of groundnut viz., POL1 and TMV 2, indicated the following: (i) a linear relationship between 1000-seed weight and seed size was observed; (ii) the per cent oil content of seed was negatively correlated with seed size (iii) the per cent total free fatty acid content estimated as per cent of oleic acid was comparatively high in larger seeds than in the smaller ones; (iv) the protein content expressed as percentage, was positively correlated with seed size; (v) graded seeds recorded significant increase in germinatian over the ungraded; (vi) the imbibition rate significantly increased with the duration of soaking irrespective of seed sizes and was negatively correlated with the seed size: (vii) dry matter production was found to be significant and positively correlated with seed size at all stages of growth (viii) the field emergence potential was significantly superior to that of ungraded seeds and the rate of emergence decreased with increase in seed size; (ix) plant growth, number of primary branches, leaflet area of the fifth leaf from the apex, total number of flowers produced and the number of mature pods were all positively associated with seed size and (x) the increase in pod yields due to increasing seed size though not significant, was attributable to the increase in the total number of floriferous primary branches and flowers formed during the critical period between 31st and 50th day leading to enhanced number of peg and pod production. Increased yield of mature and dry pods to the extent of 13.4 and

6.5 per cent could be obtained from plots sown with graded seed in POL1 and TMV 2, respectively.

B. AGRICULTURAL COLLEGE AND RESEARCH INSTITUTE, MADURAI.

The Agricultural College and Research Institute, Madurai is engaged in teaching, research and extension education. The Institution offers B.Sc. (Ag.) and M.Sc. (Ag.) courses adopting the trimester system of education.

Dr. C. V. Govindaswamy continued to be the Dean of the Institution. There are ten departments under the Faculty of Agriculture and four under the Faculty of Basic Sciences and Humanities. Each departments is headed by a Professor or Associate Professor barring the department of Languages and Social Sciences. The Dean is assisted by an Assistant Comptroller in office administration and a Warden and two Deputy Wardens in hostel administration, The Vice-president of the Students' club and the Staff Advisors assisted the Dean and Ex-officio President of the Students'Club in the various extra-curricular activities.

Admission: The classes for the second and final year B.Sc. (Ag.) courses commenced on July 15, 1975 and for the third B.Sc. (Ag.) on July 8, 1975. For the first B.Sc. (Ag.), classes commenced on September 2, 1975 The post graduate sessions commenced on August 11, 1975.

The number of students in the various classes studied during 1975-76 were as follows, First B.Sc., (Ag,) 77. second B.Sc., (Ag.) 81, Third B.Sc. (Ag.) 79, Final B.Sc., (Ag.) 73, and First M.Sc., (Ag.) 20, and Second M.Sc., (Ag.) 20 in all totalling 350. Besides, seven members of the staff, are doing M. Sc., (Ag.) Course in different subjects as part-time students.

Examination: The percentage of passes and the number of first classes in the Final B.Sc. (Ag.) and M.Sc. (Ag.) examinations are given below:

Course	No. of students appeared	No. passed	Percentage pass	No of first class
Final B.Sc. (Ag.) (Old regulations)	63	54	85.71	4
June, 1975 M.Sc. (Ag.)	17	17	100%	—

October 1975 examinations were conducted at Coimbatore for the students of Agricultural College and Research Institute, Madurai.

Practical Training: The undergradute students of second and third year classes underwent training in field practicals. The third year students were assigned individual plots and all the agricultural operations were carried out by students themselves.

Educational Tours: The III year B.Sc. (Ag.) students were taken on study tour to Agricultural Experiment stations at Aduthurai, Cuddalore and Annamalai University. The Final year students went on tour to Madras Bangalore and Mysore to study the different aspects of agriculture and animal husbandry.

National Cadet Corps: The Units A/3 and B/6 Company of this College were attached to 7 (Tamil Nadu) Battalion National Cadet Corps, Madurai. Sixty two cadets were recruited for the year 1975—76. The cadets were given training on foot drill, weapon-training, field-craft, map reading and civil defence for a total period of eighty hours. Eight cadets of this College attended combined Annual Training Camp at Tirupparankundram, Madurai from 23rd December 1975 to 3rd January, 1976. Eight cadets appeared for the 'C' certificate examination.

Students' Club Activites: The office bearers of the students' club for 1975-76, were elected on 26th July 1975. Thiru S. P. Jeyaprakash of III B. Sc. (Ag.) won the first prize in the A. Chidambaram Chettiar's Memorial Inter-Collegiate short story competition conducted by the Thyagaraja Arts College, Madurai and in essay competition conducted by Gandhi Birth day Celebration Council, Madurai. Thiruvalargal R. Mani and S.P. Jeyaprakash III year Students won the second prize in the essay competition conducted by Karaikudi Tamil Sangham. Thiruvalargal Ravichander and S. P. Jeyaprakash won the first prize and Thiru S. Lakshmiraj won the second prize, in the Scientific Essay contest conducted by Karaikudi Tamil Sangam for students all-over Tamil Nadu.

The students participated in the Madurai District Cricket, hockey and football tournaments. The hockey team was the recipient of a special cup as the best disciplined team in Madurai city. The College hockey ground was the venue for the Madurai University 'D' zone hockey finals when the Dean of the College was the guest of honour. The Cricket team reached the zonal finals. The foot ball team came upto the semi finals in the G. D. Naidu Memorial Football Tournament conducted by Tamil Nadu Polytechnic Madurai. Eight students took part in the inter agri M. A. S. U. sports held at the University campus Coimbatore when Thiruvalargal Mathiyazhagan, M and Ramachandran, M of II B. Sc. (Ag.) secured first place in 200 meter dash and Hop step and Jump events respectively.

The Republic Day was celebrated on 26th January and Dr. C. V. Govindaswamy, Dean of the College took the salute and addressed the staff and students assembled.

Students' Hostel: Staff: Dr. S. Jayaraj, Professor and Head, Department of Entomology was the Warden of the hostel till 30-11-75. Thiru C. R. Venkataramanan, Professor and Head, Department of Soil Science and Agricultural Chemistry assumed charge as Warden on 1-12-75. Thiruvalargal

R. Sethupathy Ramaligam, Associate Professor of Agricultural Botany and J.G. Robinson, Insturctor in Agronomy were deputy wardens till 30-11-75 and they were succeeded by Dr. M. Rangarajan and Dr. M. Gopal, Assistant Professors who assumed charge on 1-12-75.

There were 310 students in the hostel during the year. The general health of the students was quite satisfactory. Adequate medical attention was provided by the part-time medical officer of the College

Scholarships: The details of Scholarships awarded are furnished below:

	Name of Scholarship	Under graduate	Post graduate	Total
1.	Backward class Scholarship	107	5	112
2.	Scheduled caste Scholarships	130	5	135
3.	National Merit Scholarship	7	—	7
4.	National Loan	4	1	5
5.	Pondicherry State Scholarship	3	2	5
6.	Madurai District Farmers' Scholarship	2	—	2
7.	D. N. T. Scholarship	2	—	2
8.	Harijan Welfare	20	—	20
9.	State Agricultural Merit Scholarship	8	2	10
10.	I. C. A. R. Scholarship	22	6	28

Library: The number of books in the College library was 19568. Three hundred and twenty three Indidn and foreign journals were subscribed to. Besides, 30 journals were received as complimentary. On an average about 1050 persons used the library every month.

Research by the Post-Graduate Students: The result of research work done by the Post-Graduate students as part of the requirement for M. Sc. (Ag.) degree are briefly summarized below:

Agricultural Botany: To improve the protein content of high yielding rice varieties, crosses were made between varieties with high, medium and low protein contents viz., Sabarmathi, Annapoorna, IARI-5823 (high protein 10.3 to 11.1%); ADT 27 (medium protein 8.5%) and Jaya, IR 8 and Co. 35 (low protein 7.1 to 7.5%). Grain protein content was found to be negatively correlated with grain yield. The tendency for higher protein content to go with red rice in the combinations involving red and white rice varieties viz., Annapoorna x ADT 27, its reciprocal and Co. 35 x Annapoorna where the red pericarp segregants in F2, on the average, showed increase of 0.46, 0.13 and 0.70 per cent protein repectively compared with their white segregants. The F2 progenies seldom transgressed the better parent for grain protein content in all the crosses. However, the crosses Annapoorna x ADT 27 and Jaya x IARI 5823 threw

out better segregants to the extent of 2.3 per cent and 3.0 per cent respectively Heritability was generally high, the maximum being in the cross Annapoorna x ADT 27.

To improve the quality of IR 8 rice, a study was made of 13 fine grain, 6 without white belly and 4 dwarf mutants in M3 of gamma irradiated IR 8 rice. The fine grain mutants generally showed higher protein-content but invariably yielded less. Mutants without white belly were genetically interesting but were on par with IR 8 in yield. Dwarf mutants recorded considerable reduction in plant height, length of panicle, seed fertility and grain yield but were characterized by high tiller number and amylose content.

To get high yield and fine grain, seeds of F_1 hybrids involving IR 8 x GEB 24 and IR 8xIR 20 were treated with gamma rays in dosages ranging from 10 to 60 KR and with chemical mutagen, EMS, in concentrations from 50 to 150mM. While EMS caused drastic reduction of germination in higher concentrations, even the highest dose of 60 KR of Gamma-rays caused only 4 per cent reduction in these crosses. The stand was affected in all the three stages of observation with Increase in dose of gamma rays and EMS, in both crosses. The study showed both gamma rays and EMS were equally effective in inducing micro mutations. The distribution of many of the economic characters especially grain traits was skewed more or less towards the positive side indicating the possibility of isolating better types.

In a study to evalute the effectiveness and efficiency of mutagens (Gamma rays and EMS) on diploid and tetraploid of TMV 2 variety of Sesamum, gamma-rays were found to be effective in inducing chlorophyll and viable mutations and efficient in diploids when estimated on leathality basis. EMS was found to be efficient on the basis of injury and sterility. In autatetraploid, Gamma rays were more effective and EMS was found to be efficient on all the three bases in inducing viable mutations. In diploids, among EMS induced viable mutants observed in M2, 3 were dwarf, 6 early and 3 with more capsules. In autotetraploid, EMS produced a total of 24 viable mutants.

Agronomy: The effect of soil and foliar application of N, P and K on grain yield in high yielding rice varieties Co 36 and Bhavani was studied. Application of 65 per cent N and 65 per cent K as basal in combination with 25 per cent N and 35 per cent K as foliar spray in two equal splits recoreded the highest grain yield of 8237 kg/ha. There was saving of 10 per cent N by resorting to foliar application and an increased return of 17.46 per cent over the control.

The efficacy of slow-release fertilizers (Iso Butylendene Di Urea), Coated fertilizer (Sulphur coated urea and Lac coated urea) and nitrification inhibitor treated fertilizer (neem cake extract coated urea) on yield and yield compenents of high yielding medium duration rice varieties. (IR 20 nnd Co 36) showed that among the slow release materials tested, lac coated urea at 60 Kg N/ha in combination with 60 Kg N/ha as untreated urea top dressed recorded tha highest grain yield of 9398 kg/ha and also the maximum recovery of added nitrogen.

In the crop sequence studies on high yielding rice varieties of the Periyar-Vaigai command area in Madurai District, it was found that Kannaki followed by Ponni and Co 2 green gram recorded the maximum grain production of 16970 kg/ha yielding a net profit of Rs. 14,914 per hectare per annum. A maximum return of Rs. 4.62 per rupee spent was obtained from Kannaki followed by Ponni.

The optimum time of sowing for the single and second crop areas in Periyar tract of Madurai District using two varieties viz. IR 20 and Ponni (Mashuri) and the interaction between seasons, levels of nitrogen and varieties showed that the crops sown on 14 th, 29 th August and 28 th September recorded significantly higher yield (4948 kg, 4837 kg/ha and 5168 kg/ha respectively) than 30 th July and 13th September sowings (4034 kg and 4473 kg/ha respectively). Therefore the optimum sowing date for the single crop season would be the second fortnight of August and for the second crop season, around 28 th September. Among the varieties, IR 20 recorded the maximum yield of 4790 kg/ha which was sinificantly superior to Ponni. The economic dose of nitrogen in the single crop area was 106-108 kg/ha, for IR 20 and 86-92 kg/ha for Ponni. For the second crop in fhe double crop area it was 117 kg/ha and 102 kg/ha for IR 20 and Ponni respectively.

Soil Science and Agricultural Chemistry : The varied aspects of phosphorus fertilisation, availability, fixation and uptake were studied with four representative soils of South India. Among the phosphates tried viz., ammon nium phosphate, dicalcium phosphate, superphosphate and rock phosphate, super phosphate was found to be superior in all the soils. A close correlation was observed when soil test values obtained at different stages of crop growth were correlated with yield and uptake of phosphate. Bray No. 1, Bray No. II and Truog's extractants were found to be the most suitable ones in predicting the grain and straw yields. Available phosphorus by Bray No. II and Truog' methods was closely correlated with the total uptake of phosphorus from all the four types of soils. Olsen's methods was found to be best suited to alluvial and red soils.

A study was made on the physico-chemical properties of alkali soils of Ramnad district and suitable amendments to reclaim them. Gypsum was found to be the most effective amendment for the reclamation of alkali soils while press mud was found to be economical.

The effect of liming on the physical, chemical and biological properties was studied in acid-alluvial and laterite soils of southern districts of Tamil Nadu. Nitrogen availability and uptake by plants were increased with increased levels of lime application. Exchangeable potassium was found to increase with increased levels of lime. Phosphate availability increased upto pH 7.0, the availability decreasing with further increase in pH. Application of lime stimulated the growth of soil microbial population. The increased

pH due to liming favoured the multiplication of bacteria, actinomycetes and *Azotobacter*. Fungal population decreased considerably after liming.

Studies were made of the soil sturctural indices in relation to certain physical and chemical properties of two major lateritic and two major alluvial soil series of Cauvery delta, Tamil Nadu. It was found that the behaviour of each series was independent with different structural indices. The relationship of the structural coefficient and clay was alike in all the series indicating that clay was the dominant factor influencing this index. The stability index recorded positve correlation with the clay content in all the series except one. As regards chemical constituents, soluble silica established good positive correlation with aggregation index and stability index. Sesquioxides, loss on ignition and organic carbon had relationship with one or two structural indices in each series.

Entomology: Studies on the interrelationships between gingelly phyllody MLO and its leaf hopper vector, *Orosius albicinctus* showed that the MLO was able to be transmitted within a period of half an hour of inoculation period. Phorate as seed treatment (4%) and side dressing (1.25 kg a. i./ha) and Orthene (1.5 kg a.i./ha) as spray afforded satisfactory protection from phyllody vector.

Studies undertaken to test the pathogenicity of the fungus *Cephalosporium lecanii* Zimm in Coffee green bug showed that the pest was highly susceptible to infection by the fungus at concentration of $16x10^6$ spores/ml. The surfactants Tween 20, starch and Lerdat increased the effectiveness of the fungus. Orthene and DDT were found to be synergistic with the fungus. The fungus was more effective as a high volume spray than as low volume. Addition of humeotants, glycerol and diethylene glycol to the furgus increased the green bug mortality. The fungus was found to be pathogenic also to *Aphis gossypii* G., *A. craccivora* L., *Acrythosiphon sesbanii* (David), *Schizaphis graminum* R., *Pentalonia nigronervoso* coq., *Pulvinaria osidii* Mask., *saissetia coffeae* and *Penococcus insolitus*. Three to five weeks old cultures of the fungus were found to be more effective against the pests than one to two week old cultures. Among the liquid media tested, Sabourauds fluid medium and potato dextrose broth and among the grains, pearl millet and sorghum grain were found to be most suitable for culturing the fungus.

In a trial on the time of sowing of rice on the incidence of pests, gall fly infestation was observen in the peak form in the crops sown before August. The gall fly incidence was severe in the active tillering stage. The gall fly maggots and pupae were found to be parasitised by *Platygaster oryzae* upto 90 per cent during the month of October. The stem borer incidence was observed only in the second crop season. The Percentage of deadhearts increased with low rainfall and low temperature. The crop sown in August and September had higher incidence of leaf roller. The crop at

active tillering stage was found to be severely infested by whorl maggot and the peak period of infestation occurred in September as well as in November–December. The incidence of blue jassid was higher in the nursery and early transplanted crop. The crop at 60-80 days after sowing had higher incidence of green jassid during the month of September-October.

The life-history of the rice whorl maggot, *Hydrellia* sp., a pest coming in to prominence in recent years were studied. Two braconids namely *Choribus* sp., and *Xiphisternum* sp. was found to parasitise the whorl maggot upto 21.8 per cent. In the investigations on the control of the pest, it was found that dusting BHC 10% (25 kg/ha), spray of fenthion 0.05% and monocrotophos 0.1% and water surface application of carbofuran 3%. phorate 10% and diazinon 10% granules at 1.5 kg a.i./ha were found to be effective against the pest.

The influende of major nutrients on the incidence of major pests of rice and their control with granular insecticides were studied. The leaf roller and stem borer incidence progressively increased with increasing levels of nitrogen. However, carbofuran at 2.5 Kg a.i./ha controlled the above pests effectively. Increased levels of nitrogen did not exert any influence on gallfly incidence. However, application of high dose (180 Kg/ha) of nitrogen combined with a high dose of phosphorus (180 Kg/ha) reduced the infestation. Application of phorate at 1.5 Kg a.i./ha along with 180 Kg N/ha reduced the gall fly infestation. Increased levels of both nitrogen and and phosphorus reduced the whorl maggot incidence whereas phosphorus alone had no effect. Phorate and carbofuran were found to be equally effective in controlling the whorl maggot.

C. COLLEGE OF AGRICULTURAL ENGINEERING, COIMBATORE.

The College of Agricultural Engineering, the first of its kind in the Southern part of India, was started by the Tamil Nadu Agricultural University during the academic year 1972–73. The College offers a five year course leading to B. E. (Ag.) degree, under trimester system of teaching. The fourth year of the course is now running along with the other three i.e., I, II & III B. E. (Ag.) courses. Thiru C. R. Shanmugham has been the Dean incharge from 6-9-74 till 31-1-76 and taken full charge of the Dean, College of Agricultural Engineering from 1-2-1976.

Admissions: Fortynine students were admitted to the I B. E. (Ag.) course during 1975–76. The first year course was commenced on 1-9-75, and the second. third and fourth year B. E. (Ag.) courses on 21-7-75. The strength of the students during the year were 49, 50, 50 and 39 in I, II, III and IV Year respectively.

Examinations: Regular tests were conducted as per the regulations of the trimester system of teaching. The results of the examinations held during June 75 are furnished below:

Class	No. of candidates appeared	No. of candidates Passed	Percentage of Pass
I B. E. (Ag.)	49	49	100
II B. E. (Ag.)	50	48	96
III B. E. (Ag.)	39	38	97

National Cadet Corps: Forty five students participated in the College National Cadet Corps.

Scholarships: In addition to Backward Class and Harijan welfare Department scholarships of the State Government, the following scholarships are being availed by the students.

Name of the Scholarships	I	II	III	IV	Total
National Scholarships to Children of School teachers	-	-	2	-	2
National Merit Scholarship - Govt. of India.	-	5	6	7	18
National Loan Scholarship -do-	3	2	4	1	10
Gandhi Memorial Scholarship to Scheduled Caste Students	-	-	-	2	2
Loan Scholarship to Scheduled Caste Students	3	3	4	4	14
Church of South India Scholarship	-	-	1	-	1
I. C. A. R. Merit Scholarship	3	4	4	3	14
Rotary Club Scholarship	-	-	1	-	1
Total:	9	14	22	17	62

Students Hostel: A separate Hostel for the College of Agricultural Engineering was declared open on September 1, 1975 by Dr. Rangaswami, Vice-Ceancellor, Tamil Nadu Agricultural University, Coimbatore. Thiru. A. Shanmugham, Assistant Professor, Zonal Research Centre took charge as Deputy warden, Engineering College Hostel on 25-8-75. 39 students of IV B. E. (Ag.) course and 13 students of III B. E. (Ag.) course are accommodated in the new Hostel. The rest of the students of the B.E. (Ag.) course are accommodated along with the students of the Agriculture Faculty in the old Hostel. The construction of buildings for two more hostel block of the College of Agricultural Engineering are now under progress.

Extra curricular activities: All the students are participating in all the extra curricular activities along with the students of the Agriculture Faculty.

D. COLLEGE OF BASIC SCIENCES AND HUMANITIES, COIMBATORE.

The Faculty of Basic Sciences and Humanities, Coimbatore commenced functioning as a sparate Faculty from 1-9-1975. This Faculty is closely associated with the Faculty of Agriculture in Research as well as in Educational aspects. This Faculty also offers a Post-Graduate degree programme leading to M.Sc. (Environmental Biology) under trimester system of teaching. The course offered by this Faculty is the first of its kind in the country.

Dr. V. Rajagopalan was in-charge of the Faculty under additional charge arrangement upto 3-12-75 and the Faculty was headed by Dr. Raj under additional charge arrangement upto 31-1-76 and under regular charge from 1-2-76. The following departments viz., Department of Biology. Biochemistry, Physical Sciences, Social Science, Languages and Fishery Science are functioning under the Faculty and the Department of Plant Physiology was added to the Faculty from 1-2-76 by bifurcating the plant Physiology wing hitherto attached to the Department of Agricultural Botany of the Faculty of Agriculture.

The M. Sc. (Environmental Biology) degree programme was formally inaugurated by Dr. Malcolm S. Adiseshiah Vice-Chancellor, University of Madras on September 22, 1975 under the Presidentship of Dr. G. Rangaswami, Vice-Chancellor, Tamil Nadu Agricultural University, Coimbatore.

Admission: Seven students were admitted to the M.Sc. (Environmental Biology) course during the year 1975-76. The first and second trimesters were conducted between 11-8-75 to 11-11-75, and 17-11-75 to 24-2-76 respectively.

Examinations: Regular tests were conducted as per the regulations of the trimester system of teaching.

E. KRISHI VIGYAN KENDRA, PONDICHERRY.

The Krishi Vigyan Kendra at Pondicherry commenced functioning from March 24, 1974, as a constituent unit of Tamil Nadu Agricultural University. This is a Fifth plan scheme financed by the Indian Council of Agricultural Research, New Delhi and the State Government of Pondicherry, Steps were taken to implement the scheme during the Fourth plan period itself.

This Kendra is an unique type of institution, multifaculty in nature, comprising training as well as research activites. The aim of this Kendra, which is the first of its kind in India is to provide training for farmers, young

school drop-outs with farm background and extension workers in improved agricultural sciences such as crop husbandry, animal husbandry, dairying, farm forestry, home science etc. Training of persons with agricultural background and with middle level of education and also technicians and semiskilled persons in Agricultural vocations are also under taken in the Institution. Simultaneously in this Institution 21 research projects that are problem orient to solve the needs of Pondicherry region and to cater to the needs of the coastal region are also in progress since September 1974. During this year, activities on inland fisheries (fishery science) has also been initiated from January 1976. The foundation stone for the building of the Krishi Vigyan Kendra was laid by Honourable Shri, Jagjivan Ram, Union Minister for Agriculture and Irrigation on August 19, 1975 at the Experimental Farm of the Kendra under the presidentship of His Excellency Shri Chhedi Lal, Lt. Governor of Pondicherry. Dr. G. Rangaswami, Vice-Chancellor, Tamil Nadu Agricultural University, Coimbatore delivered the welcome address.

Training Activities: At this initial stage itself, the Kendra is providing training facilities such as inservice and refresher courses, specially designed to improve the technical skill and competence of the staff and supporting staff of the Department of Agriculture and also to the practising farming community enrolled by the various state department of Pondicherry Government and other organisations. The following are the details of training programmes conducted during the year.

1. A three day training programme for high level technical officers of the Agriculture Department, Pondicherry on the latest technologies on rice production and vegetable production was conducted during *rabi* season in the Kendra. Seventeen officers and 43 graduate extension officers, participated in the programme.

2. **Water Management Course**: Four batches of Agricultural Extension Officers of the Department of Agriculture, Pondicherry were given intensive training on economic water management to increase rice production. Each batch was trained for a period of one month. In all 25 officers have been benefitted by this training. This training programme was supported by study tours to Coimbatore and Bhavanisagar to get acquaintance with the field work done at the Tamil Nadu Agricultural University on water management and other related problems.

3. **Intensive Rice Production Course**: This course was offered to train the middle level technicians comprising of Agricultural Assistants and Village Level Workers. So far, training for 6 batches has been conducted and 40 persons were trained.

A seven day training programme on rice production was also offered to the Demonstration Maistries. Twenty persons were trained in 2 batches. The emphasis in this training was more on practical side. Learning by doing in the demonstration farms was method of teaching adopted.

4. **Vegetable Production Course**: The course, designed for a duration of 3 days, was offered to ten middle level workers engaged in vegetable development work. In addition, farming youths of Nehru Yuvak Kendra and 75 men and 90 women farmers were also trained.

5. **Plant Protection Course**: A three day programme was organised and 20 extension officers, 29 Village Level Workers, 20 Demonstration Maistries and 184 farmers were trained on the plant protection measures on paddy to increase the rice production in this Union Territory.

6. **Tractor Maintenance**: During this year one batch of 10 I. T. I. qualified candidates was given intensive training on Tractor maintenance and Tractor operations on Farm. They were also trained on the maintenance and operations of power tiller and power sprayer. Eight candidates have secured tractor licence. This training programme was financially assisted by the Department of Industries, Pondicherry Government.

7. **Farmers Training Programme**: In collaboration with the Farmers Training Centre of the Department of Agriculture, Pondicherry, training programmes have regularly organised and conducted at various levels of the farming community. This programme covers both men and women and also weaker sections engaged in agricultural activities. At the level of convenors training programmes, two each for Pondicherry and Karaikal regions, were conducted on the subjects of improved high yielding rice varieties, effective plant protection measures and on efficient use of fertilisers and micro-nutrients.

The special one day training was also organised for the Convenors of Karaikal region on the control of Fulgarid insect on paddy. A total of 110 convenors were benefitted by this training. The convenors were also given training on vegetable cultivation and also on the nutrition aspects of the vegetables. The use of vegetables for weaker sections and home gardening were also intensively popularised by this Kendra, in collaboration with the Department of Agriculture. The practising farmers, farm women and young farmers were given the training in batches. These training programmes are organised in batches as 'institutional training' and as 'farmers contact programmes' in collaboration with the Farmers Training Centre, Pondicherry. In this one day camp, emphasis was on rice and vegetable production and the use of improved rice and vegetable varieties. A total of 30 such programmes were attended to by the staff members and 750 farmers and 60 young farmers were benefitted by this programme.

8. **Intensive Kitchen Garden Campaign**: The staff members took part in the 'Thai Pattam' kitchen garden campaign organised by the Department of Agriculture during December 1976. This programme covered the aspects of vegetable varieties, improved cultivation methods and plant protection

measures for vegetables, followed by the demonstration of laying out an ideal kitchen garden. About 2020 farmers in 26 villages were benefitted by this programme.

9. **Youth Training Programme** : The young farmers from the Nehru Yuvak Kendra were trained on the power tiller operations and maintenance in a three day programme arranged by the Krishi Vigyan Kendra. Another batch of 20 youths were given training on vegetable production.

10. **Weed Control** : A special training programme for 3 days was organised by tnis Kendra on the effective weed control methods in rice crop for the benefit of Demonstration Maistries and Gramsevaks. Forty persons were trained in 4 batches in the Experimental Farm of the Kendra.

11. **Tube well maintenance** : A training programme for one day was conducted by the Kendra for the benefit of the members of the two Irrigation Societies at Kirumampakkam on the tubewell maintenance and efficient use of water for increasing the rice production. Fortyfive members have attended thfs training.

12. **Campaigns and Exhibitions** : The Kendra took active part in the campaigns like Save grain Campaign, 'Vanamahotsava', Soil Test Campaign and other such programmes organised by the Agriculture Department. During the year, a 15 day intensive camp on vegetable production was organised by the Agriculture department in collaboration with the Kendra. A total of 2020 farmers and home gardeners were benefitted through this programme.

An exhibition was organised by the Kendra in the science club of the Kendriya Vidyalaya. An exhibition was also organised by the Kendra at its experimental farm during the function arranged at the foundation stone laying ceremony on 19th August 1975. The Kendra took active participation by setting up a section on commercial flowers in the flower show of the department of agriculture during January 1976.

13. **Demonstration** : For the benefit of Marginal farmers of Pondicherry region, the Kendra helped in organising and in conducting 10 demonstration plots with High Yielding Varieties in 10 holdings of Marginal Farmers during 1975–1976. The demonstration farmers were also given two days training on improved rice cultivation techniques. They were also helped by the guidelines of the Kendra on many of the day to day problems of rice cultivation.

A demonstration with power tiller on the various agricultural operations in rice farming system was conducted at Karaikal during the Agricultural Seminar Organised by the Rotary Club of Karaikal.

14. **Staff Activities** : The staff members of the Kendra were actively engaged in their respective field oriented problem solving research projects

and also in providing practical training and solving the problems of the farming public during their training programmes, demonstration, farmers training camps and field visits. The staff members have also visited a number of private holdings on farm advisory work in respect of rice and vegetable cultivation methods and plant protection methods. The staff members have also closely and actively collaborated with the State Departments of Agriculture, Animal Husbandry, Education, Co-operation and Nehru Yuvak Kendra in their various training programmes to educate farming public. The staff members of the Kendra is also now participating in the Marginal Farmers and Agricultural labourers Development Agency and Co-operative Dairy Project to train the farmers on the Fodder and Forage production methods.

Research : At Krishi Vigyan Kendra, Pondicherry, the short duration cultures of Tamil Nadu Agricultural University 6484 and 6523 recorded 5.10 and 5.26 tonnes/ha in 90–95 days duration. The medium duration variety Triveni outyielded the variety ADT 31, Tamil Nadu Agricultural University culture 653 and 13613 by giving an yield of 6.83 tonnes/ha in 105-110 days. The culture Tamil Nadu Agricultural University 4611 yielded 4.67 tonnes/ha in 145 days during monsoon and superior to Bhagavathi, Bhavani, IR 20 and Ponni. In the rotation experiment, rice-groundnut – rice and rice-rice-rice is superior, rice - rice groundnut, rice - ragi - rice and rice - *ragi*-groundnut. In ragi to the Co 10 pre-emergence application of Weedone @ 3.5 lit/ha + Tok E 25 @ 3.5 lit/ha or gramoxone @ 1.5 lit/ha + Fernoxone 0.75 kg/ha were effective for weed control with 80 and 82% respectively. In Brinjal variety SM 50A was significantly superior in yield (32622 kg/ha) than Pusa Purple Long, Annamalai and local variety Thengathittu. In Bhendi, variety Gumbo was significantly superior to variety Shankarpalli by giving an yield of 10,666 Kg of fruits/ha.

4. RESEARCH

The research activities at the Main Campus Coimbatore as well as at Madurai and the different Research Stations in the States under the Tamil Nadu Agricultural University continued to yield fruitful results. During the year the University made notable achievement in all the three fields of teaching, research and extension. The organisation and working of the Research Council and Extension Education Council in the University are unique and they have been instrumental in orienting our research work towards solving field problems.

The Annual Scientific Workers' Conference was held on January 2 and 3, 1976. The progress of work was reviewed and suggestion taken into consideration in formulating new research projects. There are 1123 projects in operation covering different branches of Agriculture, Horticulture, Animal Husbandry, Agricultural Engineering, Fisheries, Forestry, Food Technology, Basic Sciences and Humanities. These projects also include programmes under the various schemes financed by the ICAR, Government of India and Private Agencies and implemented at the Agricultural College and Research Institute, Coimbatore and Madurai and 19 Research Stations and centers distributed all over the State.

During the year, two Research Stations one at Mettupalayam in Coimbatore district and another at Yercaud in Salem district were started during February 1976. M/S. Seshasayee Boards Limited, Erode and M/S. South India Viscose Limited, Mettupalayam granted Rs. 1.9 lakhs and Rs. 25,000 per year for three years respectively for undertaking research work on Forestry in the University. Currently, there are 66 schemes financed by the Indian Council of Agricultural Research and other agencies.

As in the past, the progress of work in all the research projects conducted in each of the departments in different faculties of the University was reviewed by the Vice-Chancellor along with the Director of Research, respective Deans of Colleges and the Heads of Departments. Besides a thorough and critical review of the progress, made, several suggestions were given for addition, modification, revision and deletion, so as to reorient the research to current needs. The progress of research was

also reviewed by the Joint Research and Extension Council which consisted of members of both the Research and Extension Councils. In addition to these reviews, a Committee consisting of non-official members of both the Research and Extension Councils, made a detailed study of the research work carried out in all the departments of the campus at Coimbatore. After holding discussions with the research personnel, it identified various research findings worthy of dissemination to the farming community. The committee also made several recommendations on the future lines of research. The suggestions given by the committee have been incorporated in the future research programmes of the University.

The results of research on completed projects have been transmitted to Communication Centre and to the respective beneficiaries. A notable achievement in the field of research was evolving new varieties and cultures in rice, pulses and vegetables. For single cropped wetlands, two high yielding rice cultures 13945 and 13531 have been isolated. In addition to these, 23 superior early maturing rainfed rice cultures combining with high yields have been identified. In pulse, two new strains one each in *greengram* (Co. 3) and blackgram (Co. 3) were released. In vegetables, five new varieties one each in bhendi, snakegourd, ribbed gourd, tapioca and sweet potato were released. These posses the characters of high yield and better quality. In sorghum, the University Cholam Hybrid 1 (UCH. 1) proved to be best yielder. In the crop sequence study, rice (Bhavani)-rice (Kannagi)-rice (IR 20) gave the maximum income with a better per day income for wetlands. For garden land cropping system, cotton (MCU. 5)-cholam (CSH. 5) -*ragi* (Co. 10) have given maximum profit with higher per day income. A beginning has been made through the formulation of University Co-ordinated Projects (UCORP) with a view to formulate cropping system with suitable package of practices including economic use of land and water in different agro-climatic regions of the State.

Experiments in the department of Soil and Water Conservation have indicated several methods of increasing irrigation efficiency. Among the machinery developed during the year are a sheep-foot roller, furrow opener, sunflower seed-sheller, inter-cultural equipment for cashew plantations, rectangular metal bin drier, paddy pre-cleaner and hot air generator. In post harvest technology, cheaper containers like polythene lined bamboo bins are found to be better and cheaper for storing grains.

In the department of Forestry, raising *eucalyptus* seedlings in polythene containers and planting them showed better germination and faster growth.

Attempts made to evolve suitable propagule for bamboos through pot and mini-pot studies showed that cut rhizome chains of *Bambusa bambos* will regenerate, the average regeneration being 60 per cent. The department of Fisheries experiments on composite fish culture in earthern ponds using groundwater with supplementary feeding showed that the fishes attained good growth. The department of Food Technology has standardised the optimum condition for the preparation of Suji (Rava) from tapioca. Receipes for Uppuma, Kesari and Laddu have been made and they are found acceptable by the people. The department of Animal Husbandry has been engaged in research work on the economics of dairy animals feed, commercial chicken rearing and evolving hybrid leghorn to suit the local agro-climatic conditions. It was found that cotton seed fed to the dairy animals can be replaced with molasses without adversely affecting the yield.

The staff members of the University continue to evince keen interest in the research activities. A list of books and booklets published (Appendix III) and 481 scientific articles published (Appendix IV), speak on the rapid strides made in this direction. The results achieved so far under the various faculties during the period April 1, 1975 to March 31, 1976 are given in this report. The projects have been numbered following a specific guideline indicated below:

R. 1 Series	Agricultural College and Research Institute and College of Agricultural Engineering, Coimbatore.
R. 2 Series	Agricultural College and Research Institute, Madurai.
R. 3 Series	Agricultural Research Station, Bhavanisagar.
R. 4 Series	Agricultural Research Station, Aliyarnagar.
R. 5 Series	Groundnut Research Station, Pollachi.
R. 6 Series	Horticultural Research Station, Periakulam.
R. 7 Series	Horticultural Research Station, Kodaikanal.
R. 8 Series	Regional Research Station, Kaveripattinam.
R. 9 Series	I. C. A. R. Schemes at Aduthurai.
R.10 Series	Regional Coconut Research Station, Veppankulam.

R.11	Series	Regional Coconut Research Station, Coconut Wilt Disease Scheme, Muthupet.
R.12	Series	Wetland Banana Research Station, Uyyakondan-thirumalai, Tiruchirapalli.
R.13	Series	Sugarcane Research Station, Cuddalore.
R.14	Series	Cashew Research Station, Vridhachalam.
R.15	Series	ICAR Schemes at Tindivanam.
R.16	Series	Castor Research Station, Salem.
R.17	Series	I.C.A.R. Schemes at Kovilpatti.
R.18	Series	I.C.A.R. Schemes at Srivilliputhur.
R.19	Series	Krishi Vigyan Kendra, Pondicherry.
R.20	Series	Horticultural Research Sub-Station, Thadiyankudisai (Mangalamcombu)
R.21	Series	Horticultural Research Station, Yercaud
R.22	Series	Forestry Research Station, Mettupalayam

The projects have also been numbered in two categories, viz. fundamental projects under 101 to 200 series and field oriented projects under 201 series and upward. The serial numbers of each project are prefixed with an abbreviation to indicate the departments concerned.

The summary of salient findings and and results of research work carried out in the University during 1975-76, department-wise and project-wise are summarized in the following pages. The names of project leaders and their associates for different projects are given under each project title. While the overall responsibility rested with the respective Heads of Departments, the actual work on the project was carried out by the respective persons named under each project. The Dean of each College was responsible for supervision of the research activities carried out by the staff and Post-Graduate students of the respective colleges. The Director of research, besides being directly responsible for the research work carried out in the outlying Research Stations, was also the Chief Co-ordinator of all the research activities in the University and in this regard he functioned with direct responsibility to the Vice-Chancellor.

Summary of Salient Findings:

CEREALS: RICE: Research on the evolution of high yielding variety of rice with less then 100 days duration but superior in yield to Co. 39 resulted in the development of two new selections possessing better plant type, higher yielding ability and finer quality of rice. The two selections, namely, 8870 and 8872 secured from a cross between culture 2410 and IR 22 came to maturity in 98 days after sowing, when raised in January season and recorded 5955 and 5542 kg of grain per hectare respectively as compared to the yield of 5270 kg Co. 39. In the trials with advanced cultures under 105-120 days duration group, culture 658, a red grain derivative of a cross between ASD 8 and Padma yielded 6033 kg of grain per hectare. This selection is particularly suitable to Kanyakumari and the neighbour-hood districts of Kerala State as there is a preference for red grain in this area. Another high yielding selection 5202 secured from IR 8 x Co 25 cross recorded 6585 kg of grain per hectare in 123 days in the trials conducted at Paddy Breeding Station, Coimbatore. From the same set of crosses, a long duration selection 31493 yielded 7315 kg of grain in 170 days, while the standard strain Co 25 yielded 5881 kg of grain with a total duration of 178 days. Among the several mutants tested during the year, TKM 6 mutant maintained its superior performance over TKM 6 confirming its non-lodging trait and high yield potential. At Madurai, in studies on the improvement of rainfed varieties of rice for Southern districts, 23 early maturing (105–120 days) cultures which combined the yield potential of IR 8 with different genetic characters of Chitraikar, were isolated and are under multiplication. At Bhavanisagar, under the early duration group, out of nine varieties studied during summer 1975, culture 5202 recorded the highest grain yield of 5909 kg/ha registering 32 per cent increased yield over the standard Tiruveni. Under the medium duration group, out of nine varietias tried, the standard IR 20 recorded the highest grain yield of 5601 kg/ha followed by CR 12-178 with a hectare yield of 5174 kg. Under the All India Coordinated Rice Improvement Project, Aduthurai, among the entries, IET 3116 and IET 4554 registered the maximum yield of 4873 and 4757 kg/ha with a total duration of 109 and 108 days respectively. The standard ADT 31 recorded an yield of 4393 kg/ha with a duration of 110 days. At Kaveripattinam, cultures 2501, TKM 6 mutant and 8244 recorded more then 20 per cent higher yield then their respective control in different sets of trials, with yields of 4910 4004 and 3687 kg/ha respectively. Among the three, the performance of culture 8244 was cansistent. At Krishi Vigyan Kendhra (Agricultural Polytechnic) Pondicherry, in 90–95 days duration group rice varieties, culture (TNAU) 6484 and 6523 recorded 5.10 and 5.26 t/ha respectively while Amaravathi has given an yield of 4.96 t/ha. Among 105-110 days group, Triveni yielded 6.83 and ADT 31 yielded 6.33 t/ha. TNAU cultures 653 and 13613 recorded

yields of 5.90 and 6.16 t/ha respectively. TNAU culture 4611 performed superior to the others with an yield of 4.67 t/ha. Bhagavathi was next in order recording an yield of 4.34 t/ha. Bhavani and IR 20 recorded yields of 3.62 and 3.40 t/ha while Ponni gave an yield of 3.59 t/ha. In the experiment with 145-165 days duration group, Bhagavathi yielded 4.91 t/ha followed by culture 13493 and 13531 which have recorded 4.69 t/ha each Co 25, BCP 1 and Ponni registered yields of 3.50, 3.50 and 3.43 t/ha respectively.

Among the short duration rice varieties at Coimbatore, IET 1522 required less nitrogen than other varieties giving an yield of 4730 kg/ha with an optimum dose of 131.2 kg/ha nitrogen. The split application of applying 60 kg N/ha as 1/4 th basal, 1/2 at tillering and 1/4 th at panicle initiation on Co. 39 rice at Coimbatore gave an extra monetary return of Rs. 750/ha than basal application. At Madurai, in the trial with two short duration rice varieties, Kannagi and Vaigai sown at six weekly intervals from 20 th May to 24 th June, 1975, the June 24 th sowing gave the highest grain yield of 7234 kg/ha. There was a gradual reduction in duration from 20 th May to 24 June sowings upto a maximum of 9 days. In another trial, Co. 36 variety was sown at three fortnightly intervals on Ist and 16 th July and 1st August, 1975. July Ist sowing recorded the highest yield of 5331 kg/ha. During the first crop season in double crop wet lands, rice variety Kanchi recorded the maximum grain yield of 7561 kg/ha which was significantly higher than that recorded by IR 8 (6652 kg/ha) but on par with IR 20 (7502 kg/ha). A fertilizer schedule of 100 : 50 : 50 kg of N. P and K per hectar was found to be econmical. In single crop wet lands, variety Co. 38 recorded the maximum grain yield of 4898 kg/ha which was significantly superior to Co 36 and Bhavani. A fertilizer schedule of 200 : 100 : 100 kg of N, P and K has recorded the highest yield of 5246 kg/ha which was on par with 150 : 75 : 75 kg of N, P and K/ha and significantly superior to 100 : 50 : 50 kg of N, P and K/ha At Bhavanisagar, schoenite, an indegenous potassic fertilizer was compared with potassium chloride and potassium sulphate. There was no significant difference on rice yields between the sources and levels of potassium. At Aliyarnagar, 45 kg N/ha for Vaigai and 50 kg N/ha for Bhavani was found to be optimum. Combined application of NPK at 50:25:25 kg/ha recorded the maximum yield in Amaravathi (3283 kg/ha), Bhavani (4759 kg/ha) and Vaigai (3713 kg/ha). Application of 50 kg nitrogen in 5 split dose, i.e., basal, 15 th, 30 th, 45 th and 50 th days after transplanting recorded the maximum yield both Vaigai (4233 kg/ha), and Bhavani (4172 kg/ha) as against two doses (basal and 45th day). The effect of *Azotobacter* on rice under Aduthurai soil conditions revealed that there was no particular advantage due to *Azotobacter*. *Azotobacter Chroococaum* inoculants applied as seed treatment, dipping the roots of seedlings in bacterial suspension, and soil application were found to save fertiliser N

to the extent of 30 to 50 kg N/ha during different seasons, without affecting grain yield. At Madurai, application of *Azotobacter* through seed, seedling and soil along with half the recommended level of N was found to give an yield which was statistically on par with full dose of nitorgen in Kannagi.

A study on the uptake of nutrients by different varieties under varying levels of N and P indicated that the variety ADT 29 recorded the maximum uptake on N in grain at 60 kg/ha level, while IET 2508 recorded the maximum uptake of N (89.91 kg/ha) at 120 kg N/ha at Thanjavur. The variety IET 2508 recorded the maximum uptake of P (18.4 kg/ha) followed by ADT 29 at Thanjavur, while the P uptake was maximum in ASD 1 variety followed by Culture 8946 at Karaiyirppu Centre. Pre-emergence application of C. 288 at 0.75 kg a.i/ha and post-emergence application of Propanil at 3.0 lit a.i/ha were effective for direct sown rice. In the direct seeded rice under rainfed condition, application of Machete liquid at 1.5 kg a.i/ha + one hand weeding was found to control the weeds efficiently. This treatment recorded miuimum removal of major nutrients. At Pondicherry, it was observed that the two combinations of pre-emergence+post-emergence soil applicarion of herbicides (pre-emergence application of Machete granules at 1 kg a. i./ha + post-emergence application of stem F. 34 at 1.75 kg a. i./ha pre-emergence application of weedone granules at 0.4 kg a. i./ha + post emergence application of Stem F. 34 at 1.75 kg a.i./ha) were highly effective for weed control with 64.2 and 65.6 per cent weed control efficiency respectively. The grain yields obtained were 4261, 3901 and 3229 kg/ha respectively for the first, second combinations and control. In respect of water management practices, it was found that during October season, irrigating loamy soils once in two days to a depth of 5 cm gave better yields than irrigating daily or once in three days, under Pondicherry conditions. At Bhavanisagar, it was found that the per day requirement of water for rice crop ranged from 8.2 mm to 9.5 mm, the former at 6 days interval irrigation treatment and the latter at 2 days interval irrigation treatment. Under wetland conditions ofC oimbatore, the series rice (Bhavani)-rice (Kannaki)-rice (IR 20) gave the net income of Rs. 8752/ha with a net return of Rs. 25.55/day per hectare. At Bhavanisagar, rice-rice–rice in 314 cropped days gave the highest production of 18145 kg/ha recording per day production of 57.8 kg/ha. At Pondicherry, in the rice based farming system, the crop rotation of rice (Bhavani)–groundnut (TMV 7) and rice (Amaravathy) gave 13.5 t/ha with 39 kg of grain yield per day.

At Coimbatore, for the control of rice stemborer, leaf roller and leaf hopper, Furadan seedling dip followed by fenthion spray on the 30th, 45th and 65th day after transplanting was found to be superior to the newer schedules trail. This schedule increased the yield by 30 percent at a cost of treatment of Rs. 340/ha and gave a net profit of Rs. 1651/ha. Nine short duration varieties

in the germplasm were found to less susceptible to the stemborer. Rice varieties Co.36 and Co.38 showed tolerance to the brown leaf hopper. Disinfestation of the white tip nematode in rice seeds was successfully achieved by keeping the seeds in 0.1 percent of methomyl, aldicarb or carbofurn for 48 hours. Disinfestation by hot water treatment and parathion 0.025 percent spray on the 45th day after transplanting also gave good control of the nematode.

It was observed at Madurai Campus that the rice leaf roller incidence was significantly reduced by the application of carbofuran 3 percent granules at 1.5 kg a.i/ha or of phosalone 0.07 per cent as foliar spray. Carbofuran, diazinon and quinalphose granules at 1.5 kg a.i/ha were effective aginst rice gall midge. The weedicide Machete 5 percent G at 2.5 kg a.i/ha, Furadan 3 percent at 1.0 kg a.i/ha and Vijay mixed fertilizer 17:17:17: at 90 kg/ha are compatible and can be safely applied to rice crop five days after transplanting without any phytotoxic symptoms. Among 83 varieties of rice screened against pests, culture W. 1263 was found to be resistant to gall fly and the varity Kakatiya against the leaf roller. At Coimbatore, in a screening study it was observed that four cultures were moderately resistant to brown spot disease. There was increased occurrence of sheath rot and sheath blight in rice. Studies in International Rice Observation Nursery Aduthurai showed one entry from Indonesia viz; B. 1896-52-8-3-1 scored the penotypic rating 1 (excellent) with broad spectrum to diseases and insects resistance.

Sorghum: In sorghum at Coimbatore a new hybrid 'University Cholam Hybrid 1, (UCH.1) superior to CSH. 5 both in yield of grain and straw has been identified. Under irrigated conditions the new hybird recorded 5 per cent increased yield of grain and 53 per cent higher yield of straw than CSH 5. It also fared well under rainfed conditions recording 2.5 tonnes of grain and 15 tonnes of straw/ha. Among the several mutants studied for yield, 'SDN tall, was found to be the best. The tall mutant grew to a height of 160 cm and yielded 25 per cent higher yield of grain and 150 per cent higher yield of straw than Co. 18 in 105 days after sowing. Besides high yield potential, the mutant was also resistant to the mildew disease and a high degree of tolerance to the root parasite *striga*. In quality of grain, it was for superior to the local varieties. By virtue of its above desirable attributes, this tall mutant is considered to be the best among the available sorghum varietal collections. Two other high yielding varieties namely U. Ch. V. 2 and U. Ch. V. 3 of 85–90 days duration with an yield potential of 4.5 tonnes of grain have also been identified. They are undergoing multilocation trails on caltivators' holdings. Out of twenty hybrids tested at Bhavanisagar during *kharif* 1975 hybrid CSH. 6 has recored the highest yield of 3474 kg/ha followed by SPH 24 (3677 A x CS 3541) with 3468 kg/ha while the local *Sencholam* gave only 580 kg/ha. At Kaveripattinam, culture SPV, 9 recorded an outstanding yield of 1341 kg/ha under rainfed condition

almost double that of the next best viz., SPV. 61 which gave 697 kg/ha. The yield increase of SPV. 9 was 183.0 per cent over control Co. 18.

At Coimbatore, a spacing of 45 x 12 cm was found to be optimum for rainfed *cholam*. Irrigation at 50 percent available moisture and 90 kg N/ha recorded higher yield. Under limited water supply irrigation at four critical stages viz., seedling, vegetative, flowering and grain forming stages gave higher yield. At Koilpatti, under Dryland Agricultural Research Project, in the mulching experiment with Koilpatti tall, Cholam stubble mulch gave to highest grain yielding of 827 kg/ha with an increase of 78.5 percent over no mulch. In the studies on weed crop competition it was found that keeping the sorghum field free of weeds fram two to five weeks after germination was sufficient to get the maximum yield. Verification trials with sorghum hybrid Koilpatti tall showed that high level of input viz,, 40 kg N +20 kg P /ha and adequate the plant production combined with spaced sowing (45 x 15 cm) and hoeing significantly increased the fodder yield by 60 percent over the low level input and management adopted by the farmers of Koilpatti tract. At Bhavanisagar in a study on the uptake pattern of N and P by different varieties of sorghum viz; Co. 18, CSH.1, CSH.5, CSV.3 and CSV.4 indicated that the uptake of N in all the varieties increased with increasing levels of N. The variety CSH. 5 recoreded the maximum uptake followed by Co. 18 and CSH. 1. The P uptake was maximum in the variety Co. 18. Under dryland conditions of Kaveripattinam, strains CSH. 5 and Co. 18 showed no significant yield differences. The yield diffence between fertilizer application based on soil recommendation (50: 30:30: kg NPK/ha) and blanket recommendation (90:60:40 kg NPK/ha) also was not significant.

The sorghum shootfly was effectively controlled by seed treatment with either disulfoton or carbofuran at 5 kg a. i./ha. Application of carbofuran at 1.8 kg a.i./ha, disulfoton 3.9 kg a.i./ha or phorate 4.0 kg a.i./ha at the time of sowing also controlled the shootfly and increased the yield by over 100 per cent. In a screening study it was observed that sorghum varieties, CS. 3541, CS. 3697, U. Ch. V. 1 and U. Ch. V.2 were moderatly resistant to downy mildew.

Cumbu : At Coimbatore in a trial under irrigated conditions, cumbu hybrid CoH.1.recorded an yield of 2412 kg of grain/ha representing an increase of 50.7 percent over new HB. 5. Among the varieties tested, UCV.1.was the best registering a grain yield of 1878 kg of grain/ha. The hybrid as well as the varieties were found to be resistant to mildew diseases. At Koilpatti, cumbu hybrid UCH.1. gave 1045 kg of grain yield/ha and was superior to other hybrids and varieties tested viz., HB 3, HB 5, UCV 1 and K 1 under rainfed conditions. At Bhavanisagar, it was observed that the per day water requirement of *cumbu* ranged from 4.2 to 12.0 mm the former at 0 per cent available moisture with 5 cm irrigation and the latter at 75 per cent available moisture

treatment with 5 cm irrigation. At Madurai Campus, in a screening study it was observed that the University Cumbu Varieties viz. UCV.1. and UCH.1. recorded only 5.2 per cent and 3.1 per cent of green ear disease incidence while HB 3 cumbu variety showed 55 per cent disease incidence.

Ragi : In ragi, the superiority of the selection EC 4849 over local was confirmed in three of the trials conducted in farmers' holdings in Coimbatore district. At Aliyarnagar, a spacing trial on *ragi* Co. 10 showed that optimum spacing with 15 x 15 cm gave the maximum yield. Nitrogen at the rate of 27 kg/ha applied in two split doses at basal and on 25th day after transplanting recorded the maximum yield over other levels of 0, 9, 18 and 36 kg N/ha. In a trial at Kaveripattinam the yield difference were significant, variety Saradha (1065 kg/ha) registered 14.10 per cent increased yield over Co 10 (933 kg/ha) under rainfed condition. The earliest maturing selection IET 28 (88 days) recorded 978 kg/ha which represented 4.8 per cent increased yield over Co.10. In terms of per day production, strain Sarada recorded 11.8 kg' while IE.28 and Co 10 recorded 11.2 kg and 9.7 kg/ha respectively. *Ragi* Co. 7 and Co.10 gave significantly higher grain yields with fertiliser application of 90 : 45 : 45 kg of NPK/ha compared to the lower dose of fertiliser application based on soil test recommendation viz., 45 : 19 : 10 kg of NPK/ha. Fertitizer application at the two levels viz: 90 : 45 : 45 kg NPK/ha and 45 : 19 : 10 kg NPK/ha resulted in mean grain yields of 4463 kg and 1823 kg per hectare respectively. At Coimbatore a study on the influence of nitrogen fertilisation on the quality of ragi grain showed that the crude protein content of the grain was significantly increased by the application of N upto 120 kg/ha in all the three varieties viz: Co.7. Co.10, Saradha and in the culture 4849. Water requirement studies on *ragi* at Coimbatore revealed that the per day water requirement of *ragi* ranged from 5.4 to 14.8 mm the former at 70 per cent available moisture treatment and the latter at 40 per cent available moisture treatment.

Tenai : Two selections in *tenai*, namely SI 76/4 and SI 80/2 were superior to Co 3 recording 17 to 65.5 per cent increased yield besides possessing higher degree of resistance to the rust diseases.

Maize: A new pop corn hybrid (2439x2418) recorded 6993 kg/ha and was far superior to the local variety which yielded 3956 kg/ha. The difference in yield were highly significant. At Bhavanisagar, studies on water requirement of maize revealed that the per day requirement of water for maize during its crop growth period ranged from 5.4 to 9.6 mm the former at 25 per cent available moisture and latter at 75 per cent available moisture with 5 cm irrigation treatment. At Coimbatore, it was observed that application of N at 80 kg/ha and P at 60 kg/ha had significantly increased the crude protein from 9.09 to 9.74 per cent and 8.93 to 9.83 per cent, respectively. In a screening study at Coimbatore nine selections were found to be resistant to downy mildew.

Wheat : In wheat HD 2189 and UP 215 were found to yield higher than Kalyanasona under Coimbatore condition.

OILSEEDS

Groundnut : In groundnut, Ah 8401 was superior to POL 2 recording 12 per cent increased yield in a trial conducted at Coimbatore. At Bhavanisagar, during summer 1975 a culture Ah 840-11-4 has recorded the highest yield of 3140 kg/ha followed by culture Ah 8401-I-4 with 3077 kg/ha During *Kharif* 1975 culture 50-92-4-1 recorded the highest yield of 1930 kg/ha In the varietal yield trial of groundnut at Aliyarnagar TMV 9 recorded the highest yield of 818 kg/ha under rainfed condition followed by POL 1 with 675 kg/ha. The results of economics of groundnut and sunflower cultivation under rainfed condition revealed that cultivation of groundnut was economically advantageous in Parambikulam Aliyar Project area with an additional income of Rs. 1178/ha as against Rs. 622/ha in sunflower. Under All India Co-ordinated Research Project on oilseeds at Pollachi it was observed that the variety Ah 6669 (East Africa) was the earliest to flower on the 19th day after sowing. In the scattered block trial conducted with three bunch selections for the fourth year, the performance of one selection Ah 8189 (Junagadh) recorded the highest mean yield of 1546 kg/ha registering a mean increase in yield of 6.3 per cent over POL 2. The hybrid derivative Ah 8457 and the selection Ah 8461 recorded yield increase of 31.9 and 15.4 per cent over POL 2 respectively. Among the four cultures tested in the comparative yield trial, one culture Ah 8465 recorded the highest yield of 1458 2 kg/ha which was 17.8 per cent higher than strain TMV 8. Out of the eleven semi spreading entries tested under Co-ordinated Uarietal Trial the variety C 501 recorded higeer yield of 1412.2 kg/ha, registering yield increase of 7.5 per cent over TMV 8 (1313.98 kg/ha). Under off-season Nursery Projects two mass selections OSN 1 and OSN 2 were tested for the third year and they recorded consistently higher yield than POL 2 the average increase in yield being 17.2 per cent and 19.9 per cent respectively over the three years. At Tindivanam, under Co-ordinated Varietal trials in the *kahraif* season conducted with 31 bunch varieties for four years (1971-'74) brought out EX. 1-1 as the top-yielder, recording the highest per day oil production and excelling TMV 9 by 26.7 per cent. Among semi spreading varieties compared for five years (1971-1975) TMV.10 excelled all the others in per day oil production (4.02 kg/ha). Semi-spreading varieties identified for economic characters were Gujarat narrow leaf for high flower production and high shelling and RS. 138 for high proportion of 3 to 4 pods. In the averate of four years of yield trials (1971-74) with forty-two bunch varieties, the variety G 8969 recorded the highest oil production per day of 6.3 kg/ha, an increase of 23.3 per cent over the general mean. The two promising bunch cultures viz., Ah 8253 (Ah 6279 x HG 1) and Ah 8254 (Ah 6279 x TMV 3) evaluated under adaptive research trials at five research stations, recorded yield increases of 36.3 and 33.2 per cent respectively over the standard TMV 9. At Kaveripattinam, groundnut POL 2 registered 21.9 per cent extra yield over the ruling strain of the tract TMV 7 under rainfed con-

dition. Selection Ah 8184 recorded 19.7 per cent, while both NG 268 and H.2 14 registered 18.0 per cent additional yields respectively over TMV 7. POL 2 was found to be the best suited strain for the tract.

A spacing trial at Tindivanam revealed that spacing of 30 x 20 cm recorded significantly higher yield (910 kg/ha) of 14.2 per cent than the widest spacing of 30 x 30 cm (797 kg/ha). The adoption of this spacing of 30 x 20 cm resulted in a net profit of Rs. 193/ha over the widest spacing. A study on the impact of adoption of package of practices revealed that seed treatment with Thiram, spacing of 30 x 8 cm, pre-emergence application of Tok-E-25 at 2 kg a. i/ha and plant protection measures registered a net profit of Rs. 593.28/ha over the ryot's method, viz, 5 tonnes of FYM/ha and 15 x 15 cm of spacing, manual method of hoeing and weeding, and adopting plant protection measures as and when necessary. At Coimbatore, application of Alachlor at 1.5 lt a.i/ha as pre-emergence spray controlled the weeds in POL 2 groundnut. Water requirement studies of groundnut at Bhavanisagar, showed that the per day requirement of water, ranged from 5.1 to 6.5 mm, former at 0 per cent available moisture treatment and the latter at 50 per cent available moisture treatment.

At Madurai, red-hairy caterpillar *Amsacta albistriga* when treated with nuclear *polyhedrosis* virus at a concentration of 10^{9} polyhedra per ml resulted in 83.4 per cent mortality of larvae within four days. An hour of feeding by the caterpillars upon virus treated leaves was found to be sufficient to cause about 80 per cent mortality. At Coimbatore, in a study on the control of tikka leaf spot indicated that Dithane M.45 or Benlate or Duter effectively controlled the disease and increased the yield. Four groundnut types showed tolerant reaction to groundnut ring mosaic disease. The incidence of this disease was reduced by elimination of virus sources, viz., closer spacing (20x15 cm) followed by roguing out infected plants present at 4 and 6 weeks after sowing. One spray of Nuvacron a month after sowing or application of Solvirex 10 days after sowing in addition to closer spacing and elimination of infected plants increased the yield significantly.

Gingelley: Under Coimbatore conditions gingelly Si 1740 and Si 1855/1 were superior to TMV 3 giving 9.9 to 12.5 per cent higher yields. At Tindivanam, while TMV 3 yielded significantly higher than KRR 2, the mutant EMS 0.05-36—1—1 yielded higher than TMV 3 by 26 per cent. For TMV 3, a spacing of 35x15 cm with 25 N and 25 P/ha gave the maximum yield, 455 kg /ha under dry condition. Under irrigated condition, 50 : 25 : 25 of NP and K kg/ha gave maximum (705 kg/ha) yield at Coimbatore.

At Coimbatore, application of endosulfan 0.5 kg/ha in combination with Zineb M—45 at 0.2 per cent at 40th and 50th day after sowing, affo-

rded significant protection from the major pests viz., the shoot webber, gallfly and the aphid as well as the disease of powdery mildew and *Alternaria* blight. Foliar application of either Miltox or Dithane M 45 effectively controlled *Alternaria* blight. Wettable sulphur as a spray along with Dithane Z.78 controlled powdery mildew significantly resulting in increased yield.

Sunflower: At Coimbatore, the high yielding selection EC 101495 proved to be early and productive, recording 27.1 per cent higher than standard. It gave higher per day production of 25.5 kg grain as against 16.6 kg for EC. 68413. The best time of sowing at Coimbatore under irrigation was found to be August 8th and a spacing of 30x30 cm with 45 N, 60 P and 40 K kg/ha gave the maximum yield. 1801 kg/ha. Water requirements studies indicated that it ranged from 3.8 to 8.6 mm per day the former at 0 per cent available moisture with 5 cm irrigation and the latter at 75 per cent available moisture with 5 cm irrigation. In a study on the control of rust, leaf blight and major pests of sunflower at Coimbatore revealed that two sprayings with Dithane M.45 + Endosulfan or Fenthion, effectively controlled the diseases and major pests and also increased the yield significantly.

Castor: At Castor Research Station, Salem, out of 20 crosses attempted between four long duration strains and five short duration strains and varieties, 13 crosses were successful and the seeds were collected. Seeds of strains TMV I and TMV 2 were irradiated with six doses of gamma rays ranging from 55 kR to 80 kR and the seeds were collected for study in M_2 generation. The LD 50 was found to be between 75 kR and 80 kR in both TMV 1 and TMV 2 castor strains. In order to assess the general combining ability of inbreds with TMV 1 100 per cent pistillate line, eight crosses were successfully effected. Seven separate crosses were made between 100 per cent pistillate line of TSP 10 R and JHP 435 and six other monoecious lines, so as to study their general combining ability. Out of ten double crosses attempted, nine came out successful.

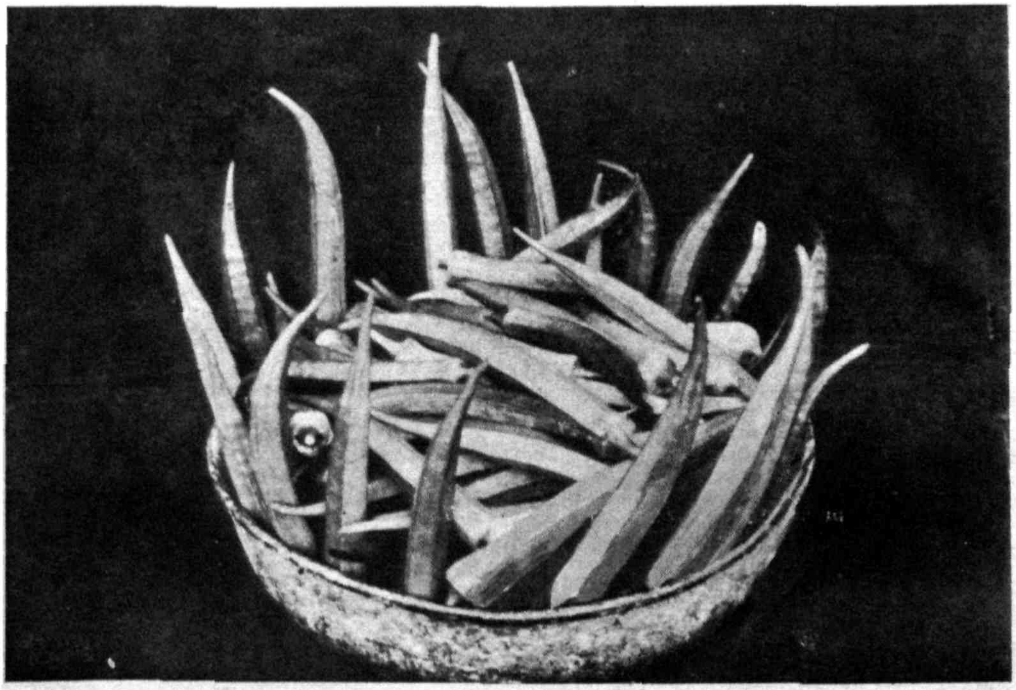
Safflower: Under Coimbatore conditions, as in the previous years, selection CTS 7218 continued to be highest yielder with 47 per cent increased yield over the standard K 1.

Coconut: Under the All India Coordinated Coconut and Arecanut Improvement Project, Veppankulam, the progeny Thiruthuraipoondi recorded the highest yield of nuts. Semi tall yellow (Malaya) recorded the highest yield of nuts (91.3) among three semi tall types from Kanyakumari. Maximum vigour and earliness was observed in the progenies involving tall as the female and Dwarf Green as male parent.

In a spacing cum manurial experiment it was observed that an application of 680 g of N, 454 g of P and 907 g of K has recorded the highest yield of 55 nuts per palm per year, the increase in yield being 70.3 per cent,

An early maturing, high yielding rainfed Co. 3 greengram.

High-yielding Co. 3 Blackgram.



Co. 1 Bhendi A Vigorous variety tolerant to yellow Vein mosaic

With regard to spacing, palm planted at a spacing of 6.1 m x6.1 m registered an increase of 940 and 1905 nuts respectively over the palms planted at a spacing of 7.6 m x 7. 6m and 9.1m x 9.1m though the yield per palm under the 9. 1 m x 9. 1 m was highest. A study on the effect of summer irrigation on coconut revealed that irrigated palms have recorded a mean yield of 96 nuts per year as against 34 nuts of unirrigated palms the increase in yield being 182.4 per cent over the unirrigated ones.

PULSES

Redgram: At Coimbatore, redgram mutant S.18 was confrimed to be the best yielder and it was superior to Co 2 recording 2614 kg and 1847 kg of grain per hectare representing an increase of 53.1 per cent and 118.2 per cent under irrigated and rainfed conditions respectively. At Kaveripattinam the terminal cluster mutants S 18 and S 19 recorded 30.6 and 22.1 per cent higher yields than strain Co 2 in a yield trial under rainfed condition, the yield differences however, were not significant, The optimum spacing for Co 2 redgram in Aliyar was found to be 45 x 30 cms for maximum yield. At Madurai, in a screening study for pests, redgram varieties AC 48, AC 53, AC 104, AC 154 and AC 172 have been found to be resistant to different pod borers. In a screening study at Coimbatore, it was observed that selection S. 18 was resistant to root rot in all the three centres tried.

Blackgram: In blackgram, culture PLS 64 which was superior to Co 2 was released as Co 3 at Coimbatore. This new strain matures in 85 days and records 18 per cent and 36 per cent increased yield of grain over Co 2 under irrigated and rainfed conditions respectively. At Kaveripatiuam, PLS 364 which showed consistently superior performance recorded 438 kg ha under rainfed condition as against 423 kg / ha in Co. 2, the percentage of increase being 3.6. Adoption of 20 x 10 cm spacing and application of 25 kg P/ha were found to be sufficient for Co 2 at Coimbatore. Application of organic wastes like pig manure, poultry manure and farm yard manure at 10 t /ha increased the mean yield of black gram, PLS 364 by 41, 24 and 26 per cent respectively. It was also found that the blackgram type No. 55 was resistant to stemfly, *Melanagromyza phaseoli*. Types AC 282 and 307 showed less than 10 per cent root rot incidence for the consecutive eight seasons. The types P.49 and US 131 were less susceptible to the tip blight disease. Four types were free from leaf crinkle under field conditions.

Green gram: Based on the superior performance in farmers' fields at Coimbatore, PLS 367/ 2 greengram was released as strain Co 3. This early maturing strain comes to harvest in 65-67 days yielding 680 kg grain per hectare under rainfed conditions with 29 per cent higher yield than Co 2. Among the mutants of greengram, one evolved through gamma irrdiation of Co 1 recorded 25 per cent higher yield than Co 1. Underrainfed condi-

tions at Koilpatti. selection S 8 gave the highest yield of 808 kg of grain/ha followed by Co 1 with 557 kg/ha. At Kaveripattinam on the performance of greengram in terms of per day productivity, M2, M4, PLS 367/2 and Co 2 recorded 13.00, 12.70, 11.85 and 9.40 / ha reppectively. Under rainfed cropping PLS 367/2, the shortest duration variety (65 days) was consistant in its performance in a number of seasons. A spacing of 25 x 5 cm for greengram Co 2 was found to be the best under Coimbatore condition. Alachlor at 1.5 a.i/ha controlled the weeds effectively in greengram at Coimbatore. In a screening study types LM 220 and MS 9385 were resistant to root rot and LM 220 was free from yellow mosaic under field conditions.

Bengalgram: At Coimbatore, in the studies on the control of pod borer it was observed that dust formulations especially endosulfan at 1.0 kg/ha applied at the time of seed formation were found to be more effective in the control of the pod borer, *H. armigera*. Two types, T65 B and PLS 9 were tolerant to the wilt and the type PLS 9 showed resistance to root rot also.

Cowpea: At Coimbatore, in a study on the feasibility of growing a suitable crop in the cold weather season in the place of horsegram, cowpea selection PLS 370 was found to yield better resulting in an additional income of Rs 600/- per hectare. Under rainfed conditions at Kaveripattinam, culture C. 152 confirmed its superiority over all other selections and standard Co 2 recording grain yield of 1198 kg/ha as against 768 kg/ha of Co 2 the increased yield being 56.0 per cent. Planofix spray at 40 ppm level at the initial flowering periods resulted in an additional grain yield of 179 kg/ha compared to the unsprayed control. The yield from the control plot was 953 kg/ha. A spacing of 50 x 10 cm for cowpea C.152 was found to be the best, under Coimbatore conditions. In a storage study at Madurai no deleterious effect on germination was noted with activated clay treated cowpea seeds after four months of storage.

COTTON

Fibres: At Coimbatore, an early maturing cotton CRH 68 suitable cultivation in rainfed tracts was found to be highly promising, yielding 329 kg of kapas per hectare even under severe drought conditions as against 70 kgs of kapas recorded for Bharathy. This selection is under district trials in 21 centres during this year. Among the new selections of cambodia cotton tested for yield, ELS 380 proved superior to MCU 5 with 9.6 per cent higher yield of kapas and 3.6 per cent higher ginning percentage. Research on evolving a hybrid superior to CBS 156 has resulted in the isolation of Hybrid H_3 which proved better to CBS 156 both in yield and quality. In the All India Coordinated Cotton Improvement Project, Koilpatti, the selection C 50 proved its superiority over Bharathi being earlier by 10 days and more tolerant to drought and jassids

with an yield potential of 1091 kg/ha, 21.8 per cent higher than Bharathi fetching an additional profit of Rs. 488/per hectare. At Srivilliputhur two cultures ELO 631 and ELO 575 recorded significantly higher yield of the order of 17 and 15 per cent respectively over the standard MCU 8. In the Co-ordinated Varietal trial, conducted at Aduthurai, out in the 22 varieties tried against the standards Krishna and MCU 7, SVPR 75 recorded a mean lint yield of 405 kg/ha as against 372 Kg/ha in MCU 7, the present standard. It possessed a mean fibre length of 26.4 mm as against 24.1 mm in MCU 7. Two varieties IC 1024 and Reba-B-50 were found to be resistant to bacterial blight. These varieties are being utilised for evolving resistant types.

In MCU 5 a spacing of 75x20 cm with three seedling per hole gave the highest yield with a saving of 15 days in duration at Coimbatore. Skip row planting registered significant yield in CBS 156 over conventional method of planting in single row. For CBS 156 during winter season 80 kg/ha was found to be sufficient. Application of phosphorus and potassium in split doses *viz.*, half as basal, 1/4th as top dressing at square initiation and 1/4th as foliar spray increased the cotton yield significantly in MCU 5. The foliar application of nitrogen on MCU 7 at 45th day saved 15 kg N/ha with an additional income of about Rs. 1507/ha. Irrigating at 20 per cent available moisture using 743.6 mm of water including rainfall gave significant yield in MCU 7. Topping on 90th day after sowing in MCU 5 increased the yield whereas topping in CBS 156 had no significant yield increase. Application of 40 ppm of Cycocel on 60th day on MCU 5 cotton increased the cotton yield whereas in CBS 156 it reduced the yield. Treating MCU 5 cotton seed with *Azotobacter* culture and broadcasting and mixing the culture in the soil before sowing saved 25 per cent of the fertiliser nitrogen for the crop. At Srivilliputhur, application of 75 per cent nitrogen with, soil application and seed treatment of *Azotobater* recorded 1339 kg seed cotton/ha with a net profit of Rs. 966 ha over the normal application of nitrogen 100 per cent (60 kg N per hectare) with an yield of 1020 kg/ha. At Coimbatore, a study on the control of bollworms indicated that Phosalone 35 EC at 2.5 lt/ha sprayed seven times at 10 days interval commencing from 55th day of sowing effectiveness against bollworms and other sucking pests. A nematode, *Hoplolaimus sp.* was found to be associated with the incidence of *Fusarium* and *Verticillium* wilt of cotton. Soil application of Nemagon or Bavistin or Kocide reduced the *Verticillium* wilt disease. Four cotton cultures were resistant to root rot.

Mesta: At Coimbatore, growing *mesta* during May and harvesting at the green pod stage gave significantly high yield. Variety AMC 108 was the best yielder. Among sunnhemp, variety Bapatla local recorded the maximum fibre yield and the application of potash alone and in combination with

phosphorus reduced fibre yield. The best time for planting Capsularis jute JRC 212 and Olitorius jute JRO 632 is 16th March and 16th April respectively.

SUGAR CROPS

Sugarcane : Among eight varieties under study during mid season (February-March) at Cuddalore, Co N 68075 recorded the maximum tonnes followed by Co 6304 with 15.94 tonnes of sugar/ha. Among the ripeners, Cycocel recorded maximum sucrose of 11.50 followed by Polaris and Sodium metasilicate with 11.30 and 11.23 respectively.

Sugarbeet: The best time for sowing sugarbeet at Coimbatore was found to be October 1st followed by October 16th. Variety Mariabo resistopoly was superior to Mariabo magnopoly. Closer spacing of 40 x 20 cm at 120 kg N/ha recorded higher sucrose content and yield of 60.5 t/ha.

FORAGES

In Lucerne, Anand 2 continued to be the best, yielding 80.9 tonnes of green fodder/ha, In Cowpea C 14 and C 28 were superior to Co 1 both recording 16 tonnes of green fodder/ha representing an increase yield of 12 per cent over strain Co. 1. At Coimbatore, experiment conducted to study the crude protein content of fodder maize as influenced by varieties, N and P application has shown that among the four varieties tried Ganga-5 recorded the maximum crude protein content (9.90 per cent) followed by Deccan hybrid (9.43 per cent) and local (8.47 pertcent).

HORTICULTURE

Fruits: Among the edible diploid *acuminata* bananas, 'Pisang lilin' was identified as a potential male parent at Coimbatore. Clones like Klue Teparod, Bareli Chinia, and Govakkar that are *balbisiana* in constitution showed high female fertility. The banana hybrid '135' which resembled the hill banana 'Virupakshi' in taste and flavour, also possessed an attrative golden yellow fruit colour. Growing Robusta in higher densities by double planting increased the returns by as much as 79.40 per cent. At Uyyakondanthirumalai, Trichy district among the introduced exotic diploiods of mono-specific genome (AA), the clone 'Pisang lilin' of Malayan origin was an early bearer having longer fruils. Its high polleniferous character was exploited sucessfully in inter diploid breeding. A new "black stemmed" mutant spotted out had intense black pseudostem with green fruits. In other respect it resembles normal Nendran. The superior desert cultivar "Kanchi Vazhai" is multiplied for large scale cultivation. The physiological malady of Poovan, 'Kottai vazhai' (seedinees) causing major loss to the growers can effectively be controlled by a single spraying of 2, 4 at 25 ppm immediately after the completion of fruiting phase. The length and weight of fruits were superior to normal Poovan fruits. The nutritional requirment of Nendran banana grown under wetland system of banana culture was assessed to be 100 g N, 60 g P and 150 g K (per plant/ year) resulting in a saving of about Rs. 375/- per hectare over the genera

state level recommendation of 110 N, [illegible]35 P and 330 K (g per plant/ year). In a study at Madurai, the aerated steam therapy of banana suckers at 50°C, 53°C and 55°C for a maximum duration of 3 hours was not found to be effective against the bunchy top virus. The viability of suckers was also lost at 55°C.

In papaya hybridization programme at Coimbatore, hermaphrodite character and pink flesh of Sun Rice Solo, was observed in the F. I progenies of Co. 1 and Co. 2 when it was used as the donor parent.

In mango variety Baneshan, pruning and pruning plus ethrel treatment recorded the maximum yield of 210 fruits weighing 55.20 kg and 195 fruits weighing 53.20 kg per tree respectively as against 85 fruits with 21.00 kg in the control. Mulgoa variety also responded to the above treatment with an average yield of 927 fruits/tree with 249.47 kg.

In grapes, among the varieties in germplasm collection, Black Champa, Oval White Convent, Large Black and Hussaini continued to *show promise in respect of yield and quality. For Muscat Hamburg, the* telephone system was identified as suitable method of training. Studies on chemical weed control in grapevine yards conducted at Periakulam with several herbicides indicated that atrazine, simazine and alachlor at 1.0, 1.0 and 2.5 kg a. i./ha are significantly superior to hand weeding in controlling the weed population working out to an estimate saving of Rs. 10/- per weeding per hectare in the cost of operation.

At Madurai, in the nutrition trial of guava, among the application of graded doses of K (0, 0.5, 1.0 and 1.5 kg/tree) with constant levels of N (0.5 kg) and P (1.0 kg) per annum, applied to three bearing varieties Smooth Green, Chittidar and Lucknow 49, one kilogram of muriate of potash per tree per annnm increased the yield of fruits in all the three varieties, the increase being 114.2, 54.2 and 36.0 per cent respectively during the year 1974-75.

In sapota air layering was successfully accomplished at Periakulam with 5,000 ppm of IBA treatment in the "difficult root" sapotas recording 40 per cent rooting. It was also found that these air-layers can be successfully transplanted in pots if the medium used is a mixture of fine loam and shreaded moss at 1:1 radio.

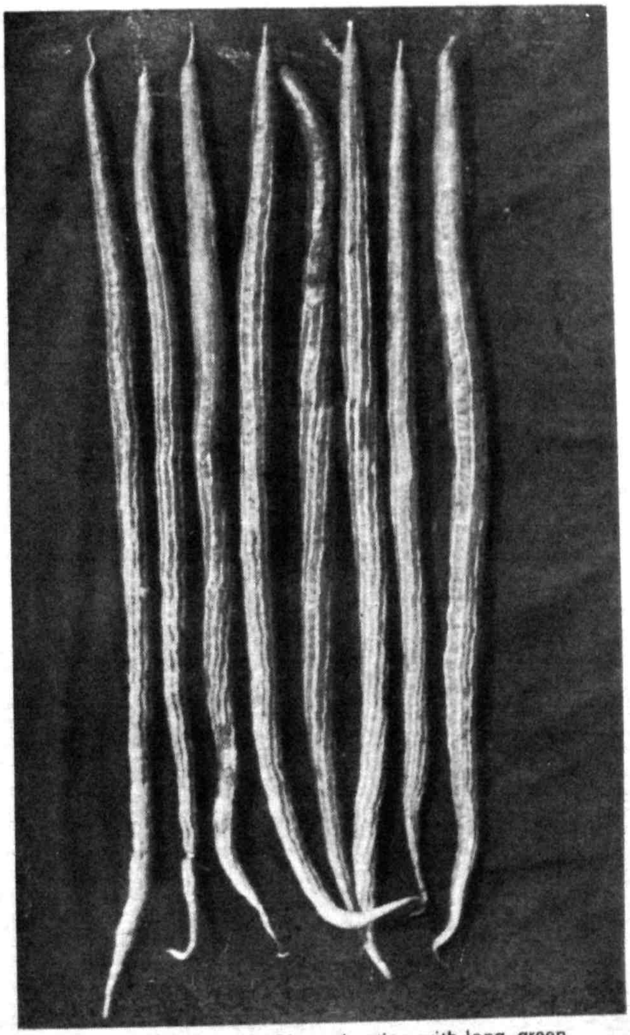
Atemoya, a new hybrid of *A. souamosa* and *A. cherimola* has been developed for release as a new strain at Periakulam. It possess the desirable attributes of its parents and bears fruits of excellent quality with very few seeds. It is capable of yielding approximately 5 tonnes of fruits/ ha, valued at Rs. 10,000/-.

At Kodaikanal a clonal selection of apple Parlin's Beauty (Kodaikanal-1), a mid-season variety recorded the highest yield of 352 fruits (40 kg) fetching an income of Rs. 160 per tree. The quality was good with 13 to 16 per cent of total soluble sugar and 0.33 per cent acidity. The other midseason variety was Winter Banana yielding over 300 fruits (38 kg) with 13 per cent total soluble sugar and low acidity. The early varieties Carrington and Irish Peach yielded 267 and 243 fruits respectively. A combined spray of Sandolin 'A' 0.5 per cent + Gibberllic acid 500 ppm + Alar 2000 ppm resulted in a mean tree yield of 201 fruits (26.200 kg) compared to 93 fruits (11.150 kg) of control in Parlin's Beauty. The additional income was Rs. 60/- per tree.

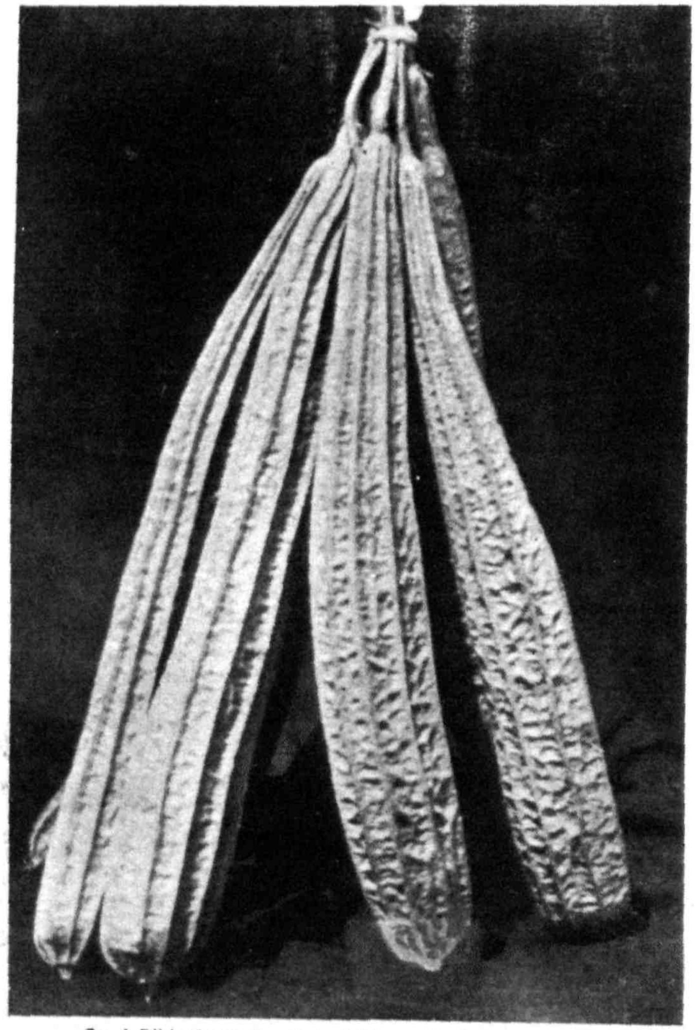
At Cashew Research statf on, Vridhachalam, the tree M. 15/4 continued to show promise as a high yielding selection (3289.5 kg/ha) with medium size nuts. The progeny K. 20/5 maintained its superiority over all progenies in this centre (4.700 kg of nuts/tree). Seedlings parentage produced more nuts (3.300 kg) than inarches (2,400 kg) per tree. August to November were favourable for planting air layers with 66.7 to 91.4 per cent success. Intensive cultural treatments increased the yields in cashew with additional profits of Rs. 956/- per hectare over no cultutal treatments. It was assessed that urea could be safely combined with the routine insecticidal sprays of Thiodan (0.95 per cent) with no adverse effects. Foliar application of 2, 4-D (10 ppm) increased the fruit set and 66 per cent more yield than untreated plants with an additional profit Rs. 1,042/-ha. Fenitrothion (Sumithion 1 per cent) was found to be effective in controlling the stem borer in cashew.

Vegetables: At Coimbatore, five new strains of vegetables were released for cultivation one in each of bhendi, snakegourd, ribbed ground, sweet potato and tapioca. Co. 1 bhendi is a vigorous variety tolerant to yellow vein mosaic. The fruits are long, tender and scarlet red/in colour with less crude fibre, high starch and protein. It yields 14 t/ha in 90 days with 8 per cent higher yield than Pusa Sawani. Application of aldicarb granules at 1 kg/ha, 15 days after showing gave effective control for the sucking pests of bhendi. Bhendi variety Clemson spineless found to be resistant to red spider mite. Seed treatment with Agrosan G. N. followed by application of Aldicarb granules a week after showing; spraying Endosulfan at 30 days after showing and Endosulfan+wettable sulphur at 50 and 65 days after sowing was very effective in controlling all insect pests, virus vectors, mites, nematodes, fungal and viral diseases of bhendi and resulted in an additional income of Rs. 3,500/- per hectare.

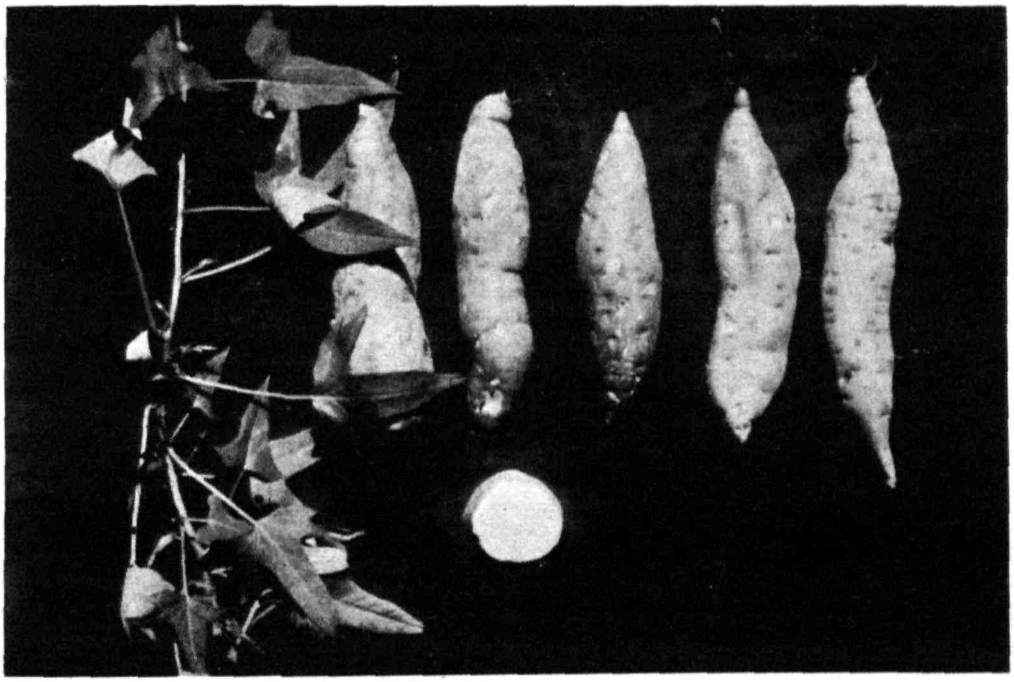
A mutant of tomato, I M 39, with determinate character, dwarf stature, high yield and shorter duration has been advaced for yield trail. A few lines of tomato, resistant to pests and diseases and suitable for summer season have been identified. High degree of resistance to the root-knot nematodes was found in variety Sl. 120. Soil drenching of tomato nursery



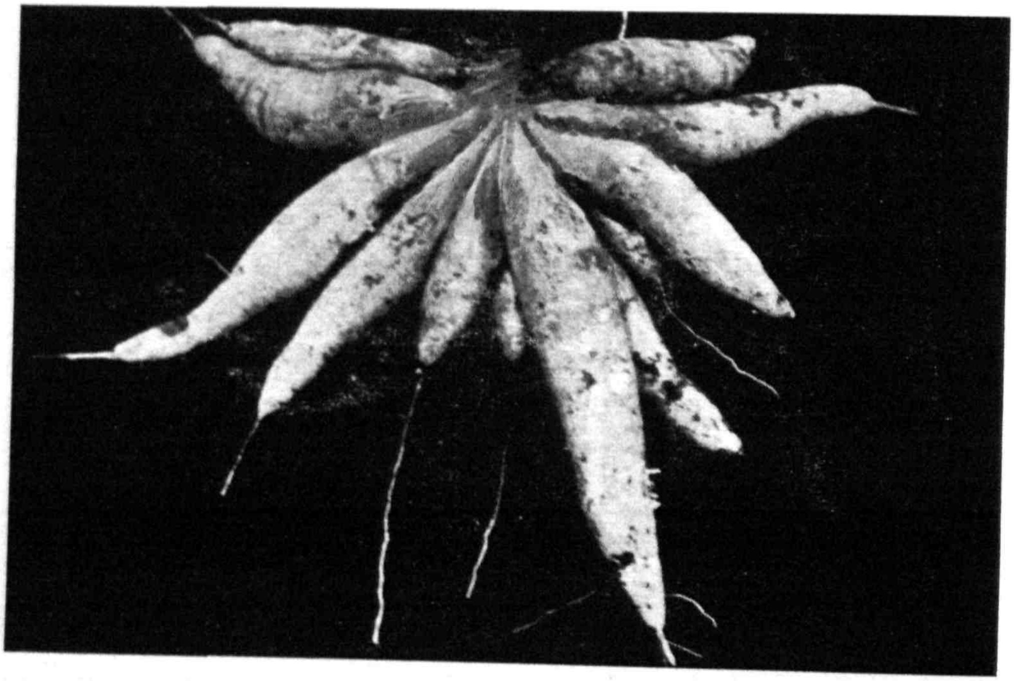
Co. 1 Snake gourd - Short duration with long, green white striped variety



Co. 1 Ribbed gourd - High yielding with long green fruit.



Co. 1 Sweet Potato - High yielding, rich in starch and total sugars.



A New high yielding variety Co. 1 Tapioca

with wet ceresan 15 days after sowing followed by application of Aldicarb granules 7 days after transplanting, spraying with Dithane M. 45 at 30 days after planting and Dithane M. 45 + Endosulfan (at 45 and 60 days after planting was effective against virus vectors, nematodes and diseases. These treatments resulted in an additional income of Rs. 10,000/ha.

At Coimbatore, one selection of brinjal is under multi-location trail. In the agronomic trials conducted at Coimbatore, there was a reduction of weed growth to the extent of 23 to 38 percent in the drip irri gation plots of brinjal. Application of aldicarb granules at 1 kg/ha, 15 days after transplanting gave effective control of the sucking pests. In brinjal thist reatment also controlled the nematodes. The brinjal fruit borer infestation was significantly reduced when 4 sprayings of monocrotophos or Sevimol were given at 0.1 per cent, at fortnightly intervals, commencing from 45 days after transplanting.

The released Co. 1 snake gourd is a short duration variety suitable for monsoon and summer season. It yields 18 t/ha in 135 days. The fruits are long and green with white stripes.

The released Co. 1 ribbed gourd is a long green fruited variety yielding 14 t/ha in 125 days, recording 25 per cent increased yield over the local variety. In bitter gourd, spraying of ethrel 150 ppm, NAA 50, 100, and 150 ppm and C.A 100 ppm has increased fruit set considerably resulting in higher yield. In the spacing cum manurial trial in Co. 1 pumpkin, there was no difference in the fruit yield among the different spacings or sources of manure.

At Periakulam, the Pusa Rashmi variety of radish recorded the maximum yield of 37,750 kg/ha as compared to 26,638 kg/ha in Contai short. At Kodaikanal the variety 'Golden Acre' of cabbage yielded 66.5 t/ha while the local gave anly 63.3 t/ha. The heads were more compact and had a better market appeal.

At Coimbatore, one selection of chilly is under multi-location trial. At Koilpatti, ten types of chillies which had recorded higher yields ranging up to 103.77 per cent under germplasm collection and two hybrid derivatives (1407 X 1395 and 1447 X K, 1) which had recorded higher yields upto 136.68 per cent than standard K. 1 strain have been isolated. Application of carbo-furan granules reduced the mosaic incidence in chilli.

At Coimbatore, the released clonal selection Co. 1 sweet potato yielded 28.33 tonnes of tubers per ha with 17.6 per cent increase over the local. It has a crop duration of 135 days. The tubers are fairly free from weevil infestation and rich in starch and total sugars. Application of N in two split doses two third as basal and one third through foliage a month after planting increased the yield of tubers of sweet potato by 37 per cent with a net profit of Rs. 1404/ha. Storing the sweet potato stem cuttings was found possible upto 20 days by keeping them wrapped in polythene sheets after defoliating them.

The released Co. 1 tapioca is a high yielding variety with 35.46 t/ha recording an increase of 16 per cent in a crop duration of 8½ to 9 months. The plants are tolerant to mosaic and the tubers have 35 per cent increased starch content. In a varietal performance study at Periakulam, H. 1 tapioca recorded the maximum yield of 48.8 t/ha while Malavella, the ruling variety yielded 33.3 t/ha. The additional yield recorded by H. 1 represents an extra income of Rs. 4,500/-. Dipping of tapioca setts for 15 minutes in vitavax, Bavistin, Benlate or Thiram was effective against sett rot disease.

Flowers : In an yield trial with 6 clones of *J grandifiorum.* at Coimbatore, the clone Lucknow, recorded significantly higher yield (3.82 kg flowers per plant) than the other clones under comparison. Monthly soil application of NPK and farm yard manure increased the flower yield by 31 per cent over control in *J. grandiflorum.* A survey on market acceptance indicated a preference only to the concrete of *J. grandiflorum* at a price of Rs. 7000 lg.

In Rose, one hybrid seedling of the cross Spartax X Edward came to flowering. The flowers possessed a keeping quality of 48 hours as against a very poor keeping quality of six hours in Edward. Pruning of Edward rose in October increased the flower yield by 37 per cent.

In Crossandra hybridization programme, F_3 progenies of the combination Orange X Red have been forwarded to preliminary yield trial. Two intervarietal hybrids, all inter specific hybrids of *Hibiscus rosa Hibiscus schizopetalus* and one intergeneric hybrid of *H. rosasinesisxMalvaviscus arborous* are found tox be promisjng in respect of colour and flower form. At Madurai, in tube-rose *(Polyanthes tuberose)* among four different tuber weights used as the planting material, the tubers weighing 39 g mean tuber weight has registered an increase of 101 per cent increased over yield control (6 g).

Medicinal and Aromatic plants : In the trials conducted at Kodaikanal, pyrethrum yielded flowers through out the year. Fourteen single plant selections of pyrethrum giving over 500 flowers in the first year of planting have been made. The slips were planted for multiplication. The pyrethrin content was more in January.

In geranium, the terminal cuttings proved to be the optimum material for propagation recording 90 per cent success. Planting geranium cuttings in polythene containers induced better rooting and facilitated easy establishment. The oil recovery from terminal cuttings was better than middle and basal. The quality of oil obtained in January was the best.

In mint, *Mentha citrata* recorded better rooting in polythene tubes. It yielded the highest herbage of 13,000 kg/ha in four months of planting. The oil yield was more in *M. citrata* than *M. piperita* and *M. spicata*. Planting in last week of June proved to be the optimum season for establishment of *Mentha*.

SEED TECHNOLOOY

In the department of Seed Technology, it was observed that application of 100 kg K with 100 and 50 kg of N and P respectively had resulted in obtaining increased quantity of graded seeds (retained by sieve performations of 18 mm x 1.5 mm) to an extent of 879 kg/ha in Co 37 and 263 kg/ha in Bhavani paddy.

Maximum production of UCH 1 hybrid bajra seeds, 1187 kg/ha, was obtained by sowing the male parent four days after the female in a ratio of four rows of female alternated by two rows of male. For processing the seeds of this hybrid and its parental lines 4'/64 size sieve is recommended.

Application of 35 kg of N with 10 kg of K/ha was found superior to augment the seed yield and quality of the seed in Co 2 redgram. For storing redgram seeds under ambient temperature and relative humidity with minimum loss in viability and vigour, use of moisture-vapour proof container like paper (50/60 g) aluminium foil (0.009 mm thick)-polythene (150 guage) laminated pouch and seed protectant like captan (75 per cent WDP at 75 g/100 kg of seed in 500 ml of water) is recommended. Black gram seeds possessing 7-8 per cent seed moisture content could also be stored under similar conditions in a similar container with minimum loss in viability and vigour. For determining the quality of black gram seed lots, testing the electrical conductivity of seed leachate was found to be reliable. Discoloured green gram seeds recorded 58 and 59 per cent germination and field stand as against 86 and 94 per cent respectively by the normal coloured seeds. Discoloured seeds gave only 65 per cent of the yield obtained from the ungraded seeds. Only normal coloured seeds irrespective of seed treatment and storage container maintained high germination of 93 per cent even after 15 months of storage.

The seed yield in sunflower EC 68413 was significantly influenced by the application of 60 kg of P/ha, the yield obtained being 865 kg against 590 kg/ha recorded in the control plot. The optimum fertiliser combination was found to be 60 kg N and 60 kg P/ha. Seed treatment with Captan 75 per cent WDP at 200g/100 kg of seeds in 500 ml of water and packing the treated seeds at 7 to 8 per cent seed moisture content in paper-aluminium foil polythene laminated pouch are recommended for short or long term carry over of seeds with high initial viability under ambient temperature and relative humidity.

The pod yield of POL 2 groundnut was increased by 13.3 per cent by the application of 20 kg N per hectare. Phosphorus and potassium application did not influence the pod yield. The yield was increased by the use of large sized kernals. Packing POL 1 groundnut kernels at 6 per cent seed moisture content after treatment with soapnut power (*Acacia concinna*) or neem leaf powder at 1:100 ratio in paper-aluminium foil-polythene laminated pouch will minimise the loss in viability and vigour up to nine months of storage under ambient temperature and relative humidity.

In Co 1 tomato, the size of the fruit was positively associated with seed recovery percentage and seed quality, irrespective of the stage of ripening of the fully developed and matured fruit. Seed extraction with concentrated hydrochloric acid (HCl) was superior to other methods. The recovery of quality seeds reduced after the sixth picking. The yield of graded seeds was increased by the application of 100 kg/ha in each of N, P and K and with a spacing of 75 x 80 cm. Wide spacing by plants (100 x 80 cm) gave 80-90 per cent seed recovery. Seeds of Pusha Purple Long brinjal and of Pusa Sawani bhendi can be stored in cloth bag for over 18 and 24 months, respectively under ambient temperature and relative humidity, obtainable at Coimbatore. Seeds of ash gourd exhibit dormancy.

FORESTRY

Forestry : In the department of Forestry attempts made to evolve suitable propagule for bamboos, through pet and mini-plot studies, showed that there is an indication that cut rhizome chains of *Bambus bambos* will regenerate. At Bhavanisagar, the field experiment conducted to identify suitable tree species of energy-fuel value, under unfertilised and rainfed conditions, showed that maximum percentage of survival was observed in *Acacia planifrons* which recorded a mean survival of 94.6 per cent followed by *Hardwickia binata* (84.0 per cent) and *Acacia leucophloea* (80.0 per cent).

SOIL AND WATER CONSERVATION ENGINEERING

Soil and Water Conservation Engineering : In the department of Soil and Water Conservation Engineering, the water requirements for Co 39 (Amaravathi) was estimated by cultivator's method and water saving method as 94.00 cm and 61.50 cm respectively working out to about 35 per cen saving of water. The experiments on 'evaluation of irrigation' method for cotton have shown that nearly 30 to 50 per cent of the water could be saved by adopting alternate furrow irrigation and skip furrow irrigation. The water requirements for Banana in drip method is only 1/4 of the control (flooding) method. The yield and water used in drip control method are 15.31 kg/plant with 58 cm and 15.95 kg/plant with 243 cm respectively Similarly the amount of water used for sugarcane was only 50 per cent of the control without affecting the yield of cane with drip method. The water used in drip for sweet potato was only 40 per cent of the control plot. Study on the effect of using various lining materials for prevention of seepage in farm ponds have indicated that soil cement 8:1 with 2.5 cm thick was economical compared to various other materials and is recommended for water harvesting techniques in dry land agriculture. In the wetland and paddy breeding station area, though the water levels in the wells are subjected to daily fluctuations, they remain almost at constant evel over years since 1971 until the date while in the millet breeding station area, the ground water level has declined by about 3.5 m over the same period.

FARM MACHINERY

A bullock drawn sweep with four shovels developed at the Research Centre was tested in the Department of Farm Machenery in the Zonal field for determining its efficacy in conserving soils moisture and as an intercultivating implement. The soil moisture conserved was noted to be more than in the control area. When compared with manual weeding, a saving of 62.5 per cent in cost of operation was recorded in rainfed line sown crop. By working the chisel plough in a hard pan field, the soil moisture retained was found to be more than the control plot resulting an increase of grain yield by 15.8 per cent. A power tiller, front mounted, paddy harvester has been developed. The unit can harvest and windrow the crop in an area of 0.4 ha/day, replacing 20 women to do the same operation in the normal practice. The five tyned cup feed type seed drill with shoe type furrow openers was found to be successful for sowing cotton, wheat, black gram and green gram besides the other crops already reported. Compared to dibbling behind country plough, the seed drill gave a saving of 60 to 80 per cent on time and 50 to 70 per cent on cost of operation.

AGRICULTURAL PROCESSING

In the department of Agricultural Processing apaddy pre-cleaner has been fabricated. This cleaner can clean 190 kg paddy per hour and the cost of cleaning is Rs. 2.35 per quintal at a cleaning efficiency of 97 percent. This machine is operated by a 1 HP electric motor. The cost of this unit is Rs. 6500/-. A grain winnower was fabricated and tested. All varieties of grain after thereshing, can be cleaned in this winnower, by using suitable sieves. It can clean 675 to 700 kg paddy per hour. The cost of winnowing is Rs. 0.50 per quintal. This unit costs Rs. 5,000/– with a 2 HP electric motor. A large capcity sheller for sunflower seeds gives a shelling output of 150 kg of seeds per hour. Grading and shelling of seeds and separation of kernels are all done in one operation.

Bhavani variety of paddy harvested on the 34th day after 50 per cent flowering gave the maximum grain yield, head rice recovery and out-turn. In an experiment with IR 20 variety paddy which received 100 kg N/ha as a single basal application, the breakage during milling was found to be minimum. For mechanical drying of paddy the airflow rates of 20 to 30 CEM/cu ft were found to be optimum. The impregnatinon of gunny bags with malathion at 1500 ai/square meter was superior and more economical than the other treatments, in preventing the infestation of store pests.

FARM STRUCTURES

Storage studies with Vaigai variety of paddy in various structures for one year revealed that quality is affecfed to some extent by storing in gunny bags as compared to other structures. Plastic silo provides better keeping quality.

BIOLOGY

In a study of the different silk worms in the Department of Biology tried during the year, Kalimpong A,B–Nichi, NN 6D (parents)

and NN 6D x KA, KA x NN 6D, PA 10 x KA (hybrids) were found suitable for rearing under Coimbatore conditions. Frequency of visit of honey bees to sunflower grown under different ecological conditions during this year was found to be significantly different; the isolated sunflower plot attracted more number of honey bees than that surrounded by other crops which are periodically sprayed with insecticides. During the year 1975-76 approximately 50000 packets of peat soil based rhizobial inoculants were supplied to cover approximately 20000 hectares under groundnut, various pulses, and green manure crops in Tamil Nadu and Kerala. Studies on the nodulation pattern of the germplasm collections of blackgram, greengram, redgram, bengalgram and sunnhemp indicated variations in response for nodule formation in various germplasm collections. Composite cultures of *Rhizobium* caused better nodulation and pod yield in greengram. *Azotobacter chroococaum* inculants applied as seed treatment dipping of the roots of seedlings in bacterial suspension, and soil applicatien were found to save fertiliser N to the extent of 30 to 50 kg N/ha with different seasons, without affecting the grain yield. At Madurai, application of *Azotobacter chroococaum* through seed, seedling and soil alone with half the recommended dose of N was found to give an yield on par with full dose of N in rice (Kannaki). The cement dust pollution in the vicinity of cement factory on CSH 5 variety of sorghum caused reducation in the statch content. The paper factory effluents caused reducation in the germination of various seeds to the extent of 10 to 90 per cent. When the sago factory effluents were passed through soil column, the bad odour was not found in the filtrate. Potato virus free plantlets were obtained from infected potato cultivar, Red Eyed President, by meristem tip culture. Haploid plants were obtained in Nitsch medium supplemented with coconut milk after two months in *Datura* by another culture. At Madurai, it was observed that when amiben was incorporated as sole nitrogen source and cellulose as carbon source in the medium, it stimulated the growth and cellulose activity of the fungi viz., *Curuvlania sp.* and *Aspergillus tervens*. These two fungi were also found to occur predominently in machete treated soil. Four different grape varieties were screened for their suitability of fermentation in the following order. Muscut = Thompson seedless > Bangalore blue > Anab-E-Shahi.

PHYSICAL SCIENCE

In the biometrical analysis of rice varieties conducted at Physical Sciences Department it was uniformly noted that the compactness of the panicles and the number of panicles contributed more to yield and the fineness of the grain attributed to less yield. In *ragi*, it was noted that the number of tillers contributed more to the yield. The rhizosphere and non rhizosphere soil samples of bengalgram grown in red soil treated with press mud increased the water-holding capacity and pore-space of soil. The Press mud improved the physical soil conditions. Physical properties of red soil treated with farm yard manure and grown with green-

gram improved the water holding capacity and the percentage of pore space. Changes in the physical properties of soil and plant characters due to cement dust deposition revealed the significant changes in height of plant, size of the nodes, internode distance and the angle of leaves compared to the crop in the undeposited field. Edward Rose flower petals were extracted with the solvent, hexane, the yield of 'concrete' and the 'absolute' were 0.272 and 0.122 respectively by weight of flower petals. The black matti of sulphur from Viscose Rayon Factory was tested as an insecticide and found to control effectively the red mites on Jasmine. At Madurai, a steady reduction of 2.5°C to 5°C was observed in soil temperature of red soils treated with $MgCO_3$ at 100 g/kg when compared to untreated control. The effect was found to last for two months.

SOCIAL SCIENCES

A study was undertaken in the Department of Social Sciences on the socio-economic changes among grapes-growing families in Coimbatore district. High rate of adoption of improved agricultural practices and developing commercial outlook in agriculture were observed among the farmers. Farmhouse living, possession of modern items of furniture and household articles, use of synthetic dresses, etc., reflect their better living conditions. Economic motivation is predominant and scientific attitude is significant. Farm decisions are made by head of family. There is a shift in local leadership from traditions to formal. There is rise in marriage age of men and women. Radio, cinema and gramasevaks serve as effective means of communication for disseminating agricultural information to farmers. Head of family was the most important factor in adoption of innovation. Value system is key to adoption and a study of value system is useful in understanding the mechanism of adoption process of innovation and its prediction.

A study of sociological implications of off-farm migration of labour was undertaken among mill-workers in textile mills in and around Coimbatore city. The analysis of result shows that lack of assured irrigation for agriculture was the main cause for migration (77.6 per cent) Conventional socio-psychological causes of migration have been found to be not significant; inadequate land for cultivation (12.8 per cent), low wage-income in agriculture 6.4 per cent) and problems in joint family (3.2 per cent) had been only minor reasons for the migration. Inadequate wage was the sole cause of migration of landless labour. The dependency has increased in the urban set up; 69.4 per cent of them had four or more dependants. Inspite of increase in wages, there is no rise in real income. However, they have savings in the form of provident fund, life insurance and national small savings. The migrants (58.5 per cent) wish to return to villages and their original love for agriculture had remained undiminished and unchanged through decades. This is confirmed by the attitude study which indicates their favourable attitude for agriculture (70 per cent). At Madurai, a study on social change among banana growers has revealed that the educational progress of

the second generation is remarkably high among the banana cultivators. The educational mobility score is 1.29 (times) more than the first generation. The progress is very high (1.64) among the big farmers followed by marginal (1.58), medium (1.24) and small (1.00) farmers. Only 24.4 per cent of the credit needs of the farmers have been met by institutional channels. During the last five years, farmers have invested Rs. 68.92 per head. Out of this 49.5 per cent was spent on well digging and installation of pumpsets. Land purchase and other improvement account for 24.2 per cent, house construction and maintenance 16.1 per cent and the remaining 10.2 per cent was spent on various other items like education of children, purchase of cattle, repayment of debts, etc.

LANGUAGES

In a study conducted in the department of Languages, it was found that students attending Tamil medium course in science do not receive the instruction properly because the teachers fail in a large measure in communicating properly although their mother-tongue is Tamil and their attitudes are favourably disposed. i) They do not use matching words in matching positions, or differentiating words/antonyms in differentiating positions whenever they use popular words in technical sense. This results in the failure of the students to perceive scientific relationships between facts and concepts. ii) Teachers do not use proper associations while relating the new information with the knowledge that the students already possessed. This results in their failure to remember scientific information and to recall them without any distortion. iii) Teachers do not topicalise important information or bring the key words to 'Focus' position and iv) when they use analogies, they do not clarify the distinction between the anology and the scientific concept behind a technical word, which result in distorted under-standing of the scientific information. v) Further, they communicate key messages imparenthetical forms instead of in key sentences which mislead the students in respect of relative importance between key information and subsidiary information. In respect of analysis of extension education communcation by scientists in the F. T. C. it has been found that owing to the density of proverbs and use of all sorts of proverbs, the communicatees fail to perceive the direction and purpose of the communication, and fail to remember key messages. The analysis of farm broadcasts has revealed that straight talks do not succeed owing to i) the presence of a large number of technical words and ii) lack of programming of information in relation to the expectancies and knowledge of the receivers. It has been found that the rulers of the yore felt it their bounden duty to guard the sources of water like the rivers, ponds and wells, to collect and store the rain waters by digging and deepening the ponds and to regulate their use by throwing open the small ponds for drinking purposes, and the big ponds (later developed into lakes) for irrigation purposes.

FISHERY

In the department of Fishery Science, the attention was concentrated in devising ways and means of maximising fish production from

inland water sources by application of improved technology since the utilisation of all available sources of water is of vital importance in food production work. Rearing facilities were made by a set of plastic pools, small earthern ponds and cement cisterns supplied with ground-water. Studies on fish culture using sewage effluents also formed an important aspect of the year's work. Observations revealed that in plankton production, best results were obtained by the application of urea at 100 kg/ha along with organic manure specially raw cow dung at 10 t/ha, This combination for aquatic manuring ensured high fry survival. Fish production of 2057 kg/ha/annum was obtained by polyculture of carps in cement cistens with semi-static water with supplementary feeding. This result is of significance to the agriculturist who can advantageously raise a crop of fish in cisterns watered from the irrigation wells before the water reaches the fields. Composite fish culture with eight species of carps done in small dug-out earthern ponds of 15 m x 12 m x 1 m gave fish production ranging from 2722-3055 kg/ha/annum with fertilisation and supplementary feeding : while fish production from sewage-fed ponds worked out to 6828-8496 kg/ha/annum. Composite culture with four carp species conducted in Bhavanisagar gave production of 2250 kg/ha/annum. Monoculture of gourami and the river catfish were continued. It was seen that gourami is a slow grower despite its consumer perference and hence unsuitable for propagation under the conditions prevailing. Experiments were carried out for providing a suitable feed for catfish using slaughter-house refuse and trash fish. Investigation of the possibilities of pollution caused by effluents from chlor-alkali plants in the vicinity of Mettr Reservoir showed presence of mercury in fish flesh ranging from 1.11 to 2.18 ppm Fish feeding experiments showed that dried and powdered silk worm pupae proved an excellent article of diet of the common carp with a conversion ratio 5.3 against the usual ratio of 2.3 for conventional feeds. Feeding trials with the fungus, *Pleurotus* did not give any appreciable fish growth.

ANIMAL HUBANDRY

In the department of Animal Husbandry, three different insecticides, malathion, sumithion, and nuvan were employed in the control of poultry lice. Sumithion at 0.125 per cent as spray on birds was found to be effective, economical and easy for application. A knapsack sprayer was used with advantage to get the birds drenched with the spray solution. The birds were free from all lice the next day itself. Spray technique was found to be an easy' labour saving, effective and time saving operation when compared to the conventional method of dipping birds. *Pleurotus* fungus residue on corncobs containing 9.1 per cent crude protein and 27.63 per cent crude fibre was incorporated to the level of 10 per cent in the feeding of chicks. There was no aversion for intake of feed mash incorporated with the residue of *Pleurotus* Fungus. At Madurai, incorporation of coconut oil cake in the place of groundnut cake at

5, 10 and 15 per cent level of the total ration was found to be on par with the growth rate of chicks. De-oiled rice bran can be incorporated upto 40 per cent in the poultry feed, releasing the maize for human consumption. Addition of de-oiled rice bran in the ration makes the ration cheaper. Spraying of pesticides DDT 5 per cent and Parathion 5 per cent at prescribed doses to the crops in grain and feeding such grains was not found to have any deleterious effect on the growth of chicks. But Malathion spray at recommended level was found to decraase the vitality of chicks and also predisposed them to coccidosis diseases.

AGRICULTURAL EXTENSION

One-third of the convenors of the Farmers Discussion Groups were rated as superior in the degree of leadership role while in the remaining two-thirds of them, half were in average level and the other half in inferior position. The individual activities and overall performance of most of the convenors as extension agents were found to be average. Convenors were relatively well educated having high social and economic status. To educate old aged and less educated farmers, a combination of talk with slides and flannelgraph + exhibition cum demonstration + discussion or a combination of exhibition cum demonstration + discussion is highly useful. For the audience either young or well educated, talk with flannelgraph + discussion is preferable to talk with slides + discussion in view of the certain advantages found in the former combination. Adoption of Soil Testing Laboratory recommendations has increased the crop yield to an appreciable extent in respect of paddy, cotton, cumbu, groundnut and ragi. Of the three information materials of folder, booklet and circular letter, the first one was found to be superior to the next two in communicability and utility in the adoption of plant protection and fertilizer application for sunflower. At Madurai, studies conducted to find out the attitude of agriculturally educated youth in going back to their own land to utilise the knowledge gained in the B. Sc. (Ag.) course, only 5.5 per cent of agriculturally educated youth stated their willingness to go back to their land to utilise the knowledge gained; 66.12 per cent were found to prefer institutional jobs and 28.33 per cent wanted to continue higher studies.

AGRICULTURAL ECONOMICS

In the department of Agricultural Economics at Coimbatore a study on growth pattern of labour force in the taluk was undertaken to investigate the pattern of employment, unemployment and growth rate of labour force in four randomly selected villages, classified as rural. One hundred sample households constituted the sample size. The salient findings of the study are: The average size of the household was 5.08. Nearly 41.5 per cent belonged to the age group of 15-34, and 23.6 per cent belonged to the age group 35.59. Those belonging to the age group 0-14 was only 27.36 per cent. Considering the occupational distribution of the 100

households, 63 were employed in 'agricultural sector' 27 in 'services' and 10 in 'industries'. Out of the 508 members 253 members, constituting 49.8 per cent, were earners and of this 177 were farmers, tenants, owner-cum-tenants and agricultural labourers. Of the remaining, 55 were employed in industries and 21 were in the service sector. The industrial labourers were working as fitters, machine operators, blowers, moulders and smiths. Most of the earners in the 'service sector' belonged to the category of secondary grade teachers, physical training teachers, bus conductors, bill collectors in the Panchayat Offices and junior assistants in office establishments. In general, all men residing in rural areas and working in the service sectors and industrial establishments were working in jobs of a medium and below-medium type. They preferred to live in villages since cost of living was comparatively low and few of them had their own farms which provided sources of additional income. A few of them had their own residences in the villages, and they opted to continue to live there. Out of the 100 households, 51 were satisfied with the present job, since they recognised that it suits their skill, knowledge and attitude towards life. The remaining 49 per cent have expressed a desire for an occupational mobility and this is primarily due to low income earning potentials of the present job. About the specificity of future plans, only 12 households have formulated a plan of action and are actively exploring job opportunities. Nearly 40 of the households belong to agricultural labour class and are desirous of switching over to non-farm occupations of an unskilled type in factories and industrial establishments. The average wage earnings of agricultural labour was Rs. 2.50 to 3.00 per women, and Rs. 4.00 to 5.00 per men. For arduous operations like digging wells, the daily wage rate for men labour was Rs. 6.00. Non-farm employment of the type identified in this investigation was restricted to men labour only and the average wage rate was Rs. 5.25 during the temporary service period, offering prospects of higher salary and fringe benefits after one year service. On becoming a regular employee, the salary earning per month exceeded Rs. 250/-. In Agriculture, on an average, 34.92 per cent of the households were employed from 151-200 days, and 26.98 per cent from 201-250 days. Only 24 per cent gets employment for 300 days and more. In the non-agricultural sector 70.27 per cent get employment for 351 days and more. The discernible disparity in incomes levels and employment opportunities lured agricultural labour towards non-agricultural occupational avenues. Measures to balance income levels in the farm and non-farm sector are desired to facilitate labour mobility towards urban areas at the desired level. Labour intensive rural works and starting agro-based industries are suggested to augment the income of rural labour households.

In a farm plan study, ten farms were selected from the farmer's discussion group attached to the Farmers' Training Centre, Coimbatore. Out of this, two optimum farm plans were prepared and these plans offer scope for increasing farm income by more than 50 per cent with existing resource level. Scientific farm plans for maximising farm income with existing

resource level as well as recoganized and developed resources levels were formulated for 15 farms in the State and communicated to the respective farmers. Three farmers responded to implement the plans ane sought financial assistance to develop their resource position. The availability of facilities from development departments and financing institutions was informed. Supply of high yielding varieties of paddy, vegetables, cotton CBS 156 and tapioca setts from the Tamil Nadu Agricultural University was arranged. In all the farm plans drawn after personal visit to the farms, it was observed that farm income could be increased more than 50 per cent by reorganising enterprise mix with existing resource level.

A study on the effect of multiple croping programme on employment potential and demand for credid was conducted based on the data obtained from multiple cropping trials for wetland condtions in Coimbatore, Aliyer and Bhavanisagar. In Coimbatore a three crop sequence of rice (Bhavani) Kannagi - IR 20 gave a maximum net return of Rs. 10,095/ha and created additional employment of 15 bullock days and 47 men days as compared to two crop sequence of rice Bhavani-Bhavani. In the three crops sequence the added return was Rs. 2. 860/— for an added expenditure of Rs. 2,275/-. In Aliyar inclusion of a catch crop sunnhemp, in between IR 20 and Co 33 did not confer substantial economic return though it created additional employment potential of 36 bullock labour days and 13 men days. The multiple cropping trials in garden lands of Coimbatore and Aliyar revealed that though there are added advantages, the farmers did not favour its adoption as they preferred to have *cholam* in the sequence for fodder. The farmers of Aliyar Project tract perferred to have two crop sequence of paddy followed by groundnut or a *ragi* or *tenai* or *cumbu* or horsegram depending upon availability of water. In the Bhavanisagar area a four crop sequence of *ragi* (Co.7)—tobacco (Vazhaikappal) Bhendi (Pusa sawani)—*Bajra* (HBI) conferred additional return of Rs. 3134 for an additional cost of Rs.2,480/- and additional labour of 12 bullock days and 291 men days.

In the comprehensive scheme for studying the cost of cultivation of principal crops in Tamil Nadu, 480 holdings were selected in different zones of the State during 1971—72 and 1972—73. The study revealed wide variations in paddy yield and cost between the different zones and between years. In 1971—72 the yield /ha ranged from 19.92 quintals in Chingleput zone to 31.48 quintala in Coimbatore, Salem and Dharmapuri zones. The total cost/ha in 1971—72 varied from Rs.1,319. 78 in Ramanathapuram, Tirunelveli zone to Rs. 2,246. 86 in Coimbatore, Salem Dharmapuri zone. The differences in costs among the regions are mainly due to differences in costs among manures and fertilisers, irrigation charges and apportioned rental value Among the total cost per hectare nearly 61 to 64 per cent constituted operational cost while 36 to 39 per cent comprised fixed cost; of the fixed cost rent alone accounted for 58 per cent. The cost of production per quintal of

paddy was Rs. 53. 47 in 1971–72 and 62.02 in 1972–73. The cost studies revealed scope for narrowing the variations in paddy yield and cost of production by increased capital investment cn modern technology.

The study on energy crisis as affecting production in Tamil Nadu was condudted in a sample of 102 farms selected in Chingelput, North Arcot, South Arcot, Thanjavur. Tiruchirapalli, Coimbatore, Salem, Madurai and Ramanathapuram districts. The performance of the farms in 1972–73 was compared with 1973–74, a fairly normal year. The sample farmers experienced problems due to the combined effecr of dearth of water in the wells coupled with thepower cut imposed. The consumption of electricity/ha in all the above districts was less in 1972–73. The reduction in power consumption was due to change in crop mix as a result of irregular interrupted and untimely power supply coulped with inadequate water supply in the wells. The substitution of bullock power in the place of electric motor was observed in only six holdings. The net returns / ha had declined in all the districts during 1972–73, the difference ranging from Rs. 61.28 in Madurai to Rs. 1,419.17 in Coimbatore as compared to 1973–74. As regards oil engines, the sample farmers expressed difficulty in the procurement of oil, that too over a short period. The experience of power cuts imposed during 1972–73 has indicated the need for integrated zonal grids for power generation and transmission and need for diversifying the methods of generation of electricity to cope up with the ever increasing demand for power from agricultural sector.

Regarding the application of fertilizers by the farmers the study carried out at Madurai campus revealed that the average quantity of nitrogen, phosphorus and potassium applied per acre of cropped area was 12.8, 6.7 and 6.6 kg respectively in Natham block while it was 33.8, 3.5 and 11.0 kg respectively in Alanganallur Block, In general, it could be said that during 1973-74, the application of fertilizers to all crops was less than the recommended dose due to the shortage of fertiliser and high cost. In view of a shortage of fertilisers, all the paddy growers had applied more organic mannures. Regarding credit requirements for the purchase of fertilizers, Co-operatives played a significant role. It was also noted that the quantity of fertiliser applied by those who availed credit from Co-operative institutions was higher than those who had not availed credit from co-operatives. Regarding preference for differrent fertilisers, it seemed to be for complex fertilisers for basal dressing and urea for top-dressing in general, for paddy.

1. AGRICULTURAL BOTANY

Experimental Results

R. 1. Ag. Bor. 112 Evaluation of germplasm stocks of *G. hirsutum*
A. Narayanan

Seven hundred and thirty five types and varieties were raised for evaluation of economic trials. Among them, 12 varieties, viz., Delfos, 3506, Bolden

EL 192, EL 582 -1, Ise 35, MA—5, UK 51, 01455, 0582-7, green wichila, EC 12400 and CB 2472 were desirable for combination of characters like plant vigour, productivity and earlinees as compared to the check MCU. 5.

R. 1. Ag. Bot 114 Development of superior cotton varieties with new plant types for irrigated areas
A. Narayanan

A new plant type No. 46 with short internodes with early maturity (15 days earlier than MCU.5) was raised in cultivators' holdings at 15 locations in the districts of Coimbatore, Salem and Madurai along with MCU. 5 to test its adaptability.

Of the 31 superior hybrid derivatives (BCF3) studied, two namely BC 112—4—I/11—9 and B C 112—4—I/11—11 were desirable for vigour and production of bolls.

R. 1. Ag. Bot. 126 Screening of varieties for isolating superior types with economic attributes in germplasm bank of safflower
N. M. Ramaswamy and M. Rangasamy

During Summer 1975, forty single plant selections were studied and among these one non—spiny selection viz., CTS. 7403 recorded an increased yield of 32.2 per cent over the promising selection, CTS. 7218. During winter 1675, germplasm collections numbering 1463 were studied to assess their yield potential and other economic attributes.

R.1 Ag. Bot. 128 Evaluation of germplasm collection of redgram and greengram
S. Ayyamperumal, R. Veeraswamy, S. Krishnaswamy, N. Mohamed Sheriff, P. Rangasamy and R. Rathnasamy

Redgram

The germplasm redgram types were grown during monsoon season. The variability existing for total duration has been assessed. The mutant entry S.18 was found to be resistant to root rot and wilt disease. It was also found to be tolerant to pod borers.

Greengram

A total of 350 types were grown and studied during summer season. L. M. 220 was found to resistant to both root rot and yellow leaf mosaic disease.

R.1. Ag. Bot. 133 Development of new male-sterile lines and testing their combining ability
R. Appadurai and S. Sambathkumar

Four male-sterile lines PT. 248/5, PT. 829/6, PT. 834/3 and PT. 888 have been developed by genome substitution in Tift 23 A cytoplasm. Another

male sterile line PT. 732/2 involving a new source of cytoplasm of Bellary origin has been identified. These are being studied for their utilisation in development of high yielding hybrids with resistance to the mildew disease.

R. 1. Ag. Bot. 201. Evaluation of high yielding cold tolerant dwarf rice varieties suitable for late *Samba* crop
V. Sivasubramanian

A total of 834 promising progenies involving 50 different crosses in F 2 to F5 generations was evaluated and 155 high yielding desirable lines have been isolated for advancing to further test.

By artificially exposing 20 days old seedlings of the above progenies to cold at 11°C in the laboratory, 31 were identified as cold tolerant lines. These lines have Co. 7 or IR. 20 as one of their parents. Their yield potential are being evaluated.

R. 1. Ag. Bot. 205 Breeding high yielding varities of rice with a duration of 120-140 days (mid-duration) with the desired plant type and superior to the existing popular strains
J. Chandramohan and V. Perumalswamy

A total of 704 hybrid derivatives of crosses involving tall *indica* rice varities and high yielding dwarf *indica* rice varieties were tested for their yield potenlial. Six cultures viz., TNAU. 658, 633, 2960, 4372, 736 and 4614 were found to give consistently high grain yield of over 6 tonnes per hectare. Culture TNAU. 658 was the best among them yielding 6033 kg grain per hectare.

R1. Ag. Bot. 206 Breeding and selection of rice varieties with fine and quality grains
J. Chandramohan and V. Perumalsamy

One thousand and three hundred thirty six (1336) hybrid derivatives of crosses made among high yielding, fine grain varities like TKM 6, Co.36, BSC. 10, RP. 4-14, SLO. 16 and Sona, were grown and studied in FI to F5. In the trials conducted with homozygous hybrid derivatives with fine quality rice, five selections namely, TNAU 4600, 4609, 4611, 19193 and 16319 were found to yield more than 5 tonnes of grain per hectare.

R.1. Ag. Bot. 207 Breeding high yielding varieties with a duration of 90 days or less with high yielding potential
A. Subramaniam and T. B. Ranganathan

Strain Co. 39 (Amaravathi) was grown in 31 holdings in Kuruvai season in Thanjavur district and it gave four tonnes of grain with a total duration of 100 days. A trail to find out the yields by continuous cropping all round the year was commenced in January 1975. Three crops were harvested in 228 days and an yield of 10.48 tonnes of grain per hectare was obtained. The fourth crop in the field is nearing harvest stage.

Among the several cross derivatives tested for selecting single plants yielding higher than Co. 39 but with similar duration, two selections namely Culture 8870 and 8872 were tested. As in the last year these two cultures gave five tonnes and above per hectare and in the*Navarai* season in 98 days. Arrangements have been made for testing these cultures over 100 locations throughout Tamil Nadu. These are derivatives from the cross culture 2410x IR. 22.

R.1. Ag. Bot. 209 Iduction of mutation in rice for getting improved varieties
A. Subramaniam and T. B. Ranganathan

Mutation breeding by irradiation and by chemical mutagens of Co. 33, TKM. 6 and Co. 32 was intensified. Three mutants secured from Co 33 and and two from TKM. 6 were tested for yield in *Navarai* season.

In respect of the mutants secured from TKM. 6, TKM. 6-20-80 was the better of the two, recording 55 per cent higher than TKM. 6 while mutant TKM. 6-0.1 per cent DES. 115 was earlier to TKM. 6 by one week and recording 28 per cent higher yield. Due to its dwarf plant type, it resists lodging at maturity. Similarly, mutant Co. 33-84 was the best among the Co. 33 mutants studied for yield and it recorded 11 per cent higher yield than Co. 33.

Many desirable mutants are available from Co. 32 variety. All of them are in the final stage of testing.

R. 1. Ag. Bot. 210 Screening of rice varieties used in breeding programme for drought resistance
J. Sakharam Rao and R. Radhakrishnan

During the year, 282 cultures, F2 and F3 progenies of rice were screenned for drought resistance under field conditions. Restricted irrigation was given and the performance of the material was evaluated and material was classified as resistant, moderately resistant and susceptible. Out of these, 31 were resistant, 55 were moderately resistant and 196 were susceptible.

R. 1. Ag. Bot. 211 Screening of rice varieties used in breeding programme for salt tolerance
J. Sakharam Rao and K. Ramachandran

Field and Laboratory evaluation of 174 cultures and progenies was done for salt tolerance. The results showed that the crosses between (PVR. 1 XIR. 8) X PVR. 1; IR. 8 X TKM. 6 were generally tolerant, crosses between IR. 22 X Kattaisamba and IR. 8 X Tadukkan were moderately tolerant while PVR. 1 X IR. 8; Gettu X Kannaki; Dasal X Kannaki; IR. 20 X Kattaisamba; Dasal X IR.20 crosses were susceptible to salinity.

An attempt was made to correlate some of the biochemical status with salt tolerance in a few chosen varieties and cultures. The tolerant

group had high values of total sugars while the chloride content was low. No possible correlation could be established between salt tolerance, and the contents of potassium, sodium or proline.

R. 1. Ag. Bot. 216 Evolution of high yielding varieties of Sorghum suited for the irrigated condition
K. Meenakshi and A. K. Fazlulla Khan

Among several mutants evaluated for yield, SDN tall was found to be the best. The tall mutant grew to a height of 160 cm and gave 25 per cent higher yield of grain and 150 per cent higher yield of straw than its parent SDN dwarf. Four series of varietal trials were laid out. Among the 41 bold grain selections tested, 810-4 was the best recording 26.7 per cent increased yield over the local strain Co. 18. Seven selections from the advanced segregating generation were taken for trials. A total number of 500 single plant selections from segregating population were made based on grain yield, planr height and colour of grain. Fifteen were advanced for trials.

R. 1. Ag. Bot. 217 Evolution of new sorghum hybrids suited to rainfed areas during the monsoon season
V. K. Kunjamma and C. Surendran

Among the elite hybrids Uch. H 7 recorded the highest grain yield of 5693 Kg/ha as compared to 5384 kg of grain/ha recorded for CSH. 5. In cultivators holdings the same hybrid yielded in an average, 20 to 25 quintals of grain and 12 to 15 tonnes of straw per hectare under rainfed conditions.

Among other set of hybrids, 3660 A x IS 3541 recorded 8445 kg of grain/ha and 21 tonnes of straw/ha while CSH. 5 has recorded 5600 kg of grain and 15 tones of stranw/ha.

R. 1. Ag. Bot. 222 Development of *cumbu* hybrids superior to HB. 3 and HB. 4 with a duration of 85-90 days
R. Appadurai and R. Subramanian

In a trail under irrigated conditions the new *cumbu* hybrids COH. 1 recorded a grain yield of 2412 kg/ha which represents an increase of 50.7 per cent over NHB. 5. In another co-ordinated trial under irrigation the hybrid gave the highest grain yield of 2400 kg/ha which was 23.6 per cent increase over NHB. 5. A newly developed variety UCH. 1 was also found promising registering a grain yield of 1878 Kg/ha under irrigated conditions. This variety is free from downy mildew disease.

R.1. Ag. Bot. 224 Evolution of high yielding strains of *ragi*
M. S. Thangam and T. S. Raveendran

The high yielding *ragi* selection EC. 4849 was tested at three locations in Coimbatore District where it registered 2940, 2855 and 2028 kg/ha

as against 2400, 2640 and 1760 kg/ha recorded by Co. 10, the yield increase of EC. 4849 over Co. 10 being 18.4, 8.1 and 15.2 per cent respectively. Laboratory studies on salt tolerance confirmed the findings that EC. 4849 has a higher degree of tolerance to salinity than the existing strains.

R.1. Ag. Bot. 226 Evolution of high yielding and short duration strains in *tenai*
R. Appadurai, S. Suresh and U. S. Natarajan

Two rust resistant *tenai* selections SI. 76/4 and SI. 80/2 registered highest yields in the trials conducted both under rainfed and irrigated conditions. S. I. 76/4 recorded grain yields of 3487 kg/ha under irrigation and 2740 kg/ha under rainfed conditions recording an increase of 65.5 per cent and 17.1 per cent respectively over the control Co. 1.

R.1. Ag. Bot. 227 Evolution of high yielding and short duration strains of *varagu*
M. S. Thangam and U. S. Natarajan

The short duration selection PS. 175 with a compact plant and panicle type maturing in about 120 days, recorded a grain yield of 4244 kg/ha under rainfed conditions showing an increase of 131.5 per cent increase over Co. 2. Since Co. 2 is late maturing (140 days) it gave very poor Yield because of failure of rains during the later period of crop growth. This high yielding early selection is to be tried under rainfed conditions in the North East Monsoon.

R.1. Ag. Bot. 229 Evolution of high yielding and short duration strains in *panivaragu*
R. Appadurai, S. Suresh and U. S. Natarajan

In an yield trial under rainfed conditions one selection PV. 346 recorded the highest grain yield of 1597 kg/ha which was significantly superior to Co. 1 by 27.5 per cent.

R.1. Ag. Bot. 230 Evaluation and selection of superior hybrids and varieties of maize suited to irrigated condition
S. Thangavelu

Out of 69 grain corn hybrids tested, one hybrid Phil DMR. 5 (CM. 202 x CM. 111) recorded the maximum yield of 6542 kg/ha as compared to 5613 kg/ha in Ganga. 5 and 5279 kg/ha in Deccan. Out of 36 opaque corn hybrids tested, maximum yield of 4650 kg/ha was recorded by hybrids V. 44 x V. 4. One pop hybrid 2439 x 2418 recorded the maximum yield of 6993 kg/ha against 3956 kg/ha in the local variety. The yield differences were highly significant. Another hybrid 2418 x 2410 has performed well recording 5253 kg/ha in the local for the last two seasons. Seventy six pop corn single cross hybrids, 53 opaque corn hybrids and 30 grain corn hybrids are presently under test.

R.1. Ag. Bot. 231 Evaluation and selection of superior wheat varieties suited for multiple cropping programme
S. Thangavelu

Among 25 bread varieties tested, one variety H. D. 2189 with a duration of 90 days recorded the maximum yield of 2649 kg/ha as compared to the yield of 2116 kg/ha in U. P. 215 with a duration of 85 days which is fast replacing Kalyan Sona. Among the 23 elite wheat varieties sown, Kalyan Sona gave the maximum yield of 2415 kg/ha which is significantly superior to all other varieties. Presently M_2 and M_3 progenies of gamma irradiated Kalyan Sona and M_1 progenies of 11 other varieties tested with different doses of gamma rays are under test.

R.1. Ag. Bot. 232 Improvement of Cambodia cotton to develop varieties superior to MCU. 5 for winter irrigated zone
S. Kamalanathan and C. P. Thiagarajan

ELS. 380 with 9.6 per cent higher kapas yield and 3.6 per cent higher ginning and ELS. 481 with 6.6 per cent higher kapas yield, 3.0 per cent higher ginning and 1.2 mm longer staple over MCU. 5 have been advanced to 15 district trials during 1975-76 Winter season.

Three selections ELS 294-2.2, 294-2.3 and ELS. 294-2.6 are found to have high yield and quality potentialities in the Main Strain Trial. They will be advanced to district trials depending upon their lint quality.

R.1. Ag. Bot. 233 Breeding new strains of Cambodia cotton (*G. hirsutum*) superior to Bharathi in yield and quality for the rainfed areas
U. Selvaraj

Two cultures viz., CRH. 68 and CRH. 71 have been advanced to District Trials and are being tested in 21 locations. CRH. 68 has recorded better yield than CRH. 71 as well as the control Bharathi. CRH. 68 is also earlier in maturity by 7 days than CRH. 71 and 13 days than Bharathi. Both the cultures offer good potentiality for raising as a rainfed crop on account of (i) early crop period (130 days) (ii) high yield and (iii) equal fibre qualities compared to Bharathi.

R.1. Ag. Bot. 234 Breeding a stiain of American Cotton (*G. hirsutum*) for the rainfed areas to replace *desi* cotton (*G. arboreum*)
U. Selvaraj

The two cultures CRH. 68 and CRH. 71 tested in district trials showed their adaptability to the *arboreum* region also and are expected to replace the *desi* cotton on account of their earliness, better yield and quality. At Coimbatore, CRH. 68 was highly promising, yielding 329 kg of kapas/ha under extremely servere conditions of drought as against 70 kg of kapas recorded for Bharathi.

R.1. Ag. Bot. 237 Exploitation of heterosis in cotton for developing superior hybrids of American cotton for irrigated areas
A. Narayanan

A total number of 427 F_1 cross combinations involving 49 parents was raised under both irrigated and rainfed conditions. Among them six hybrids, namely; 19, 29, 71, 92, 97 and 239 appeared to be desirable based on production of bolls per plant. Harvesting of the produce is in progress.

Three hybrids, namely; 2 L, CH. 4 and CH. 57 were sown in 40 locations in the districts of Coimbatore, Salem and Madurai to test their superiority over Bharathi under rainfed conditions.

A total number of 320 fresh cross combinations involving 36 *hirsutum* parents was effected for further study.

R. 1. Ag. Bot 238 Interspecific hybridization within the cultivated tetraploid species of *Gossypium* for creating new potential of quantitative and qualitative value
S. D. Peter, S. S. Narayanan and K. N. Muthiah

The two hybrids H2 and H3 of certain interspecific combination proved better than CBS. 156 in yield of kapas, lint length and strength with equal fineness and muturity. These are being tested in 16 centres in the districts of Coimbatore, Salem and Ramanathapuram along with Varalaxmi and CBS. 156. Six new hybrids were identified to be superior than CBS. 156 in yield and quality. Lint samples of H2, H3 and CBS. 156 have been sent for fibre tests.

R. 1. Ag. Bot. 239 Development of new plant types in *hirsutum* cotton suitable for population explosion and off-season cropping
S. D. Peter, S. S. Narayanan and N. Muthiah

Three selections viz., 441 A, 441 B and 4418 proved consistently superior to MCU. 7 in yield, length and ginning. They were earlier by 7 to 10 days with compact plant body for population explosion. The seeds of these selections were sent for adaptive trial in eight centres of Thanjavur and Trichy districts. Another very early selection derived from K 3400 XMCU. 5 completed its life cycle in 120 days. This medium stapled and drought tolerant selection is tested in small bulk trial.

The above four selections were subjected to four doses of gamma irradiation to identify early types in the segregating generation.

R. 1. Ag. Bot. 240 Evolution of short duration bunch strain of groundnut suitable for low rainfall areas and rice fallows
R. S. Annappan, B. Subbalaxmi and V. Muralidharan

In the comparative yield trials out of 15 varaiants including four standards, *Ah.* 8401-I/4, *Ah.* 8401 II/G and *Ah.* 8188 have recorded 2559,

2541 and 2531 kg pods/ha respectively as against 2269 kg for POL. 2 registering 12 per cent increase on POL. 2. Culture *Ah*. 8401 II/4 have higher kernel weight of 40 g per 100 kernal as against 38 g for POL 1 and 35 g for POL. 2. Culture *Ah*. 8202 recorded a pod yield of 1928 kg/ha, 78.5 per cent shelling and a low pod weight of 35 g per 100 kernal and 3584 kernals per kilogram.

In order to fix potential parents for hybridisation 42 varieties were evaluated.

To test the variability in Gangapuri variety, 1200 plants were harvested and evaluated. As a result of intensive hybridisation a total of 2,01,471 crosses were effected in three crops involving 11 parents and 17 combinations.

R. 1. Ag. Bot. 241 Interspecific hybridisation in *Arachis* for the improvement of cultivated varieties of groundnut
V. S. Raman and S. S. Abdul Salam

Natural cross pollination is highly restricted, yet natural hybrids between species of *Arachis* have been observed. The detection of hybrids, triploid and in tetraploid constitution in the open pollination progenies of the diploid F1 (*A. duranensis* x *A villose*) facilitated the synthesis of allotetraploids of the diploid species. Cross pollinations of the diploid hybrid with *A. villosa* yielded triploids and balanced tetraploids were isolated in the progeny of the cross, triploidX *A. duranensis*. As autotetraploids of the diploid species offer a ready means of introducing new variability into the tetraploid *A. hypogaea*, hybrids between this species and the tetraploid *A. villosa* were derived.

R. 1. Ag. Bot. 242 Evolution of short duration strains of gingelly with wide adaptability for irrigated areas
N. Sundaram

In a comparative yield trials with three promising types, against strain TMV. 3, Si. 1740 (reselection from Andhra Pradesh variety) gave 12.5 per cent higher yield over the strain TMV. 3, followed by Si. 1855/1 (pureline selection from Australian variety) and 50 Kr-I-6-10 (a mutant from KRR. 2 by gamma irradiation) with 9.9 and 8.7 per cent respectively. In another trial with four mutants, the mutant 50-Kr-I-12-9 and 50 Kr-I 37-2 recorded 21.3 per cent and 9.2 per cent higher yields than TMV. 3.

R. I. Ag. Bot. 244 Evolution of sesamum varieties suitable for rainfed cropping in the State
N. Sundaram

In a comparative yield trail with 8 short duration types, the reselection Si. 1740 (Andhra Pradesh) and the mutant 50 Kr. I-12-9 recorded 22.3 and 19.1 per cent higher seed yield over strain TMV. 3.

R. 1. Ag. Bot. 269 **Improving the plant type and yield potential of PVR. 1 and Co. 25 rice**
S. Palaniswamy

With a view to increase the yield potential of the varieties Co. 25 and PVR. 1 by the modification of the plant type, new investigations were commenced.

A total of 83 selections from the crosses involving T (N) 1, Co. 36, Vijaya, and IR. 8 with PVR. 1 were tested for their yielding ability. A culture 5142 was isolated from the cross Co. 25 X IR. 8 and released as Co. 38 naming it as Bhagavathi. This new variety which has a crop duration of 145-150 days from the date of sowing and yielding ability from 6 to 7 tonnes hectare has performed well in many places in Tamil Nadu. Another culture 13493 from the same cross has registered an yield of 7315 kg of grain per hectare. As its crop duration is 165-175, this new culture is recommended for growing in *Samba* season to replace Co. 25. Further large number of new cultures are under critical evaluation in different stages of breeding trials.

R. 1. Ag. Bot. 272 Breeding dwarf rice varieties suited for reduced soil condition
Sukanya Subramanian

From six cross combinations, 88 progenies were studied in F_7 and F_8 generations during the *Navarai* season of 1975 and 38 homozygous progenies were selected for further study. A total number of 100 cultures was tested in the Preliminary Yieid Trial and based on tolerance to ill-drained soil conditions 63 cultures were advanced for further trial. Among nine cultures tested under Comparative Yield Traial against eight standards, the standard Dasal recorded the maximum yield of 5557 kg/ha followed by cultures 7583, IET, 2222, culture 7609 and Kattisamba which yielded 5510 to 5884 kg/ha.

R. 1. Ag. Bot. 274 Breeding of high yielding dwarf rice varieties with resistance to Blast
V. Sivasubramanian

In a trial to isolated superior varieties with resistance to blast disease, a culture 5202 with the parentage IR. 8 x Co. 5 maintained superior performance over other cultures in combining high yield and tolerance to blast disease. In the trial during *Navarai* season, the culture 5202 yielded 6585 kg of grain in about 120 days. Since this culture in addition to being earlier by ten days and capable of yielding 408 kg higher than IR. 20 and combining tolerance to blast, it is recommended for a large scale trials in cultivators' holding in the Tamil Nadu during *Navarai* season.

Further, fresh crosses synthesised with blast resistant variety Co. 4 is being intensively evaluated.

R. 1. Ag. Bot. 275 Breeding high yielding dwarf rice varieties with resistance to Bacterial leaf blight
Sukanaya Subramanian

A total number of 376 single progenies f1om 24 sets of crosses was studied during *Navarai* season 1975 in F_3 and F_4 generations from which 390 single were selected for further study. Thirty nine homozygous cultuses of ten cross combinations were tested under Preliminary Yield Trial against eight standard varieties in two series. In series I, culture 18584 (IR. 22 x CR-12-178) recorded the highest yield af 4682 kg/ha followed by IR. 20 (4638 kg/ha). Out of 39 evaluated for blight infection by the Professor of Plant Pathology, six recorded moderate resistance. Twenty five sets of fresh crosses were effected during the season.

Among the short durations cultures maturing in 118 to 128 days culture 18771 (RP.5-32 x Bhavani) recorded the maximum yield of 4261 kg/ha followed by seven other cultures which recorded above 4 t/ha. A total number of 206 F_1 plants were selected for further study.

R. 1. Ag. Bot. 277 Breeding high yielding varieties of rice with a duration of 100-120 days with improved plant type
A. Subramanian and T. B. Renganathan

Fifty hybrid derivatives were tested for yield under All India Coordinated Rice Improvement Project trials. Two out of the fifty were found to be high yielders both in June and January plantings. IET, 2222, a selection from a cross between HR. 19 and T(N) 1 was earlier to Cauvery by one week and recorded ten per cent increased yield of grain. The other high yielding selection IET. 1444, a secondary selection in Vaigai, a strain recently released by Tamil Nadu Agricultural University gave 323 kilograms higher yield. Adequate seeds in both have been produced for conducting large scale trial in both *kharif* and *Rabi* seasons.

R1. Ag. Bot. 283 Improvement of G. *hirsutum* cotton tolerant to pests and diseases by mutation breeding
P. S. Chandramathi

One mutant number 16 (from irradiated ELS. 250) which was densely hairy was spotted out. This possessed a high level of jassid resistanee under field conditions. This is being tested in larger plots.

R. 1. Ag. Bot. 284 Induction of mutation in groundnut for isolation of economic mutants.
T. Ramanathan and B. Subbulakshmi

The mean yield performance of mutants obtained by gamma irradiation and DES treatment of POL.2 groundnut over four seasons including

1975-76 monsoon season, of comparative yield trial revealed that two out of 8 mutants, 60-69-1-19 and 0.05-39-2-71 gave 1312 kg/ha each recording 10.0 per cent increase over POL.2 followed by another mutant 0.05-39-2-which registered 1286 kg/ha with 7.8 per cent yield increase over the standard. Minimum infection of bud blight has been observed in the mutant 0.05-39-2.

R. 1. Ag. Bot. 287 Induction of mutation for high yield, high oil content, short duration and dwarf habit in castor
R. S. Annappan and I. Henry Louis

The study of M_4 during 1974-75 winter revealed that 3 mutant cultures viz., 40-5-34 B, 40-23-11 and 50-8-9 are outstanding for yield giving 50-120 per cent increased yield over SA.2 under rainfed conditions and 25-50 per cent in over all performance. Under irrigated condition 40-23-11 and 50-8-9 gave 18 and 28 per cent increased yield over SA.2. Due to adverse seasonal conditions the yield levels were below normal.

R. 1. Ag. Bot. 290 Evaluation of safflower varieties and selections for their performance under yield trial
N. M. Ramaswamy and M. Rangasamy

Five promising selections viz., CTS. 7203, CTS. 7205, CTS. 7206, CTS. 7213 and CTS. 7218 along with the strain K. 1 were tested in a comparative yield trial during 1975 summer. The selection CTS. 7218 recorded an increased yield of 47.1 per cent over the standard K. 1. It continued to maintain itssu periority in yield by recording an average yield of 1018 kg/ha with an yield increase of 102.5 per cent over the strain K. 1 during the past three years.

R. 1. Ag. Bot. 295 Evaluation of germplasm to understand the genetic diversity with particular reference to yield and other attributes in sunflower
M. Stephen Dorairaj, N. Subraman and M. Subramanian

The germplasm bank consisting of 132 varieties was raised under three levels of fertilisers and studied. Six Rumanian and three Australian hybrids were raised along with two dwarf varieties and three checks. A total of 42 hybrids and seven parents in a 7 x 7 diallel and 30 top cross hybrids are under study of combining ability. Eighteen varieties were selected based on yield, oil content and multiple resistance to pests and diseases and of these EC. 85820 (Argentina) appeared to be worthy of further exploitation. EC. 100105 (USSR) possessed field resistance to white fly, Jassids weevil and grass hopper. Four varieties tolerant to rest and seven to *Alternaria* were recognised.

R. 1. Ag. Bot. 296 Development of improved strains of redgram with short, medium and long duration and high yield potential suitable for dryland culture

R. Veeraswamy, S. Iyemperumal, N. Mohamed Sheriff and Rangaswamy

Eight promising cultures isolated from geramplasm collections were advanced to preliminary yield trial. From among them three medium duration (120-135days) cultures viz., S.78, S.80 and S.11 have recorded 25.7 per cent, 27.1 per cent and 26.1 per cent higher yield over Co.2 standard respectively. From among 180 short duration hybrid derivatives studied, 22 promising F_4 progenies were advanced to preliminary yield trial in which six cultures viz., 105-7-1, 105-19-2, 105-11-2, 113-2-1, 101-3-1 and 112-11-1 were found to be productive besides showing field tolerance to wilt and root rot disease. Selection of single row progenies on F_1 medium and lone duration redgram hybrid derivative is in progress. Of the 11 varieties tested under yield trial, PM. 1 registered higher yield over Co.1 and Co.2 standard strains.

R.1. Ag.Bot. 297 Evaluation of high yielding and early maturing varieties of redgram through mutation breeding

N. Mohamed Sheriff

Two redgram mutants viz., S.18 and S.19 were compared for yield against Co.2 both under irrigated and rainfed conditions. The mutant S.18 was significantly superior ro Co.2 recording 2514 Kg and 1847 Kg/ha under irrigated and rainfed conditions respectively which were 53.1 per cent and 118.2 per cent increased yield over Co.2. The name variants were tested in 25 cultivators' holdings during monsoon 1975. In another trial, three early mutants of red gram S. 12, S.14 and M.1 were compared with Co.2 and 'Prabhat'. The mulant S.14 and M1 and with 105 days duration recorded increased yield over Co. 2 under rainfed conditions.

R. 1. Ag. Bot. 298 Evolution of a high yielding variety of blackgram with improved plant type for cultivation in (i) dry lands (ii) garden lands and (iii) rice fallows

G. Soundarapandian and V. Mylswamy

PLS. 364, a pure line selection of a local variety from Pudukottai was released as Co. 3 during January, 1976. This variety, matures in 85 days and has an yield portantial of 1055 Kg and 481 Kg/ha under irrigated and rainfed conditions, showing 19 per cent and 36 per cent increased yield over Co.2 respectively. In another set of trials a collection from 'Musiri' recorded 10.5 per cent more yield over Co. 3 under rainfed condition. In the hybridisation programme, 91 F_6 selections were trained in an yield trial and selections C4-452/2, C4-62/3 (of the cross Co.3 x H. 21) C2-48/12 and C2-217/4 (of the cross Co.3 x T.9) were found to be promising, recording 16.3 per cent, 13.5 per cent, 14.8 per cent and 14.1 per cent increased yield over Co.3. Besides

471 F_2 single plant selections were advanced for F_3. Ten F_4 families and forty F_3 selections were tested for their yield potential and further selections made.

In the trials condudted in rice fallows at Paddy Breeding Station, Coimbatore with three varieties namely Co.2, Co.3 and M. 3. In the rice fallow trials conducted at Aduthurai with eight varietes Co.3, Musiri, Kiliikulam and ADT.1 gave yield of ranging from 204 to 208 kilogram per hactare.

R. 1. Ag. Bot. 299 Development of short duration varieties of blackgram with yield portential through mutation breeding.
G. Soundarapandian and V. Mylswami

The mutant selection M-3 (From Co.1) was tested under large scale yield trials both in the Research Stations and in the district trails and it was found to be superior registering 1228 Kg/ha which was 11.2 per cent increased yield over Co.2. In M.5 generation of PLS. 364 and H.21 treated with gamma rays, 28 selections were tested for yieid and selections H. 21-40/14 and H. 21-50/15 aecorded 13 per cent increased yield over Co.3. In the rainfed trials conducted at Research Stations selections H.21-40/14 and H.21-50/15 have recorded 19 per cent and 12.5 per cent increased yiedls respectively over Co.3. The crinkle leaf mutant with compact plant type which was found to free from disease and pests and isolated previously was tested for its yield potential and it recorded a grain yreld of 681 Kg/ha as against its parent Co.3 recording 934 Kg/ha. This variety is beeirg utilised in the hybridisation programme with the promising varieties to incorporate useful charactors.

R. 1. Ag. Bot. 300 Development of new variety of vegetable-cum-grain purpose lab-lab with earliness and drought resistance
R. Veeraswamy, S. Ayyamperumal and P. Rangasamy

A short duration (120 days) medium bushy dual purpose "Economic Mutant" was isolated from garden lab-lab type No. 9867, and compared with standard short term lab-lab varieties viz., Co. 6, Co. 7, and Co.8 in yield trial.

Mutant lab-lab has recorded 8196 Kg green pod per hectare with 23 per cent higher yield over Co. 8 lab-lab. It is photo-insensitive and can be raised throughout the year. It possesses compact bushy plant type and it need not have pandal. The pod shape is flat with 3.4 cm breadth, and 5.6 cm long which will have most common prerefence as vegetable. The quality of pod is excellent with attractive light green colour, good taste. Beside its quality the mutant possesses higher protein content over Co. 6 Co. 7 and Co. 8 lab-lab.

R. 1. Ag. Bot. 301 Development of a high yielding variety of green with improved plant type for cultivation in (i) drylands (ii) garden lands and (iii) in rice fallows.
R. Veeraswamy, S. Iyemperumal, S. Krishnasami and R. Rathnasamy

Based on the performance at exprimental stations and on cultivators holdings PLS. 367/2 was released as Co. 3 greengram, This selection

matures in 65-75 days with an yield potential of 6.8 q/ha under rainfed conditions resulling in a per day productivity of 9–7 kg/ha. It gives an increased yield of 15 per cent over Cot1 and 29 per cent over Co.2 under rainfed conditions. This strain is moderately resistant to yellow mosaic, rooi rot under field conditions. Intensive selection in F4, F5 and F6 generation of 7 cross combinations resulted in the isolation of 18 early and four medium maturing hybrid derivatives which are high yielding than the existing strains.

R.1. Ag. Bot. 302 Evolution of new varieties of green gram through mutation breeding combining earliness and high yield potential

S. Krishnasami and R. Rathnasamy

Mutant 2 of greengram evolved through gamma irradiation of Co. 1 was found to be suitable for rainfed conditions recording an overall mean yield of 1016 kg/ha representing an increase of 23 per cent over Co. 1. This has been advanced to scattered block trials.

Of the 3 early mutants of Co. 1 evolved through gamma irradiation viz., mutant 15, 16 and 17. Mutant 15 was found to record an yield of 1209 kg/ha representing an increase of 14 per cent over Co. 3. This has to be tested further.

R.1. Ag. Bot. 304 Development of an early maturing vegetable cum grain purpose cowpea suitable for both rainfed and irrigated conditions by hybridisation and mutation breeding

K. Mahudeswaran S. Iyemperumal and G. A. Palaniswamy

During summer 1975, five promising short duration types were tried in an yield trial under irrigation along with Co. 1 and Co. 2. Selections PLS. 370 (65 days) and C. 152 (75 days) recorded significantly higher yield of 955 kg and 951 kg respectively representing an increase of 31.3 per cent and 30.6 per cent over Co. 1 (100 days). This trial was repeated during main season also under rainfed conditions in which C. 152 and PLS. 370 recorded an yield of 834 kg and 786 kg respectively representing an increase of 50.2 per cent and 41.2 per cent over Co. 1.

Six promising vegetable types were tried in an yield trial during Summer '75 and Co. 2/1 recorded 6079 kg of green pods per hectare representing an increase of 29.8 per cent over Co. 2 the check. In an yield trial, 9 mutants isolated from Co. 2 were tried during winter '75.

R.1. Ag. Bot. 310 Evolution of a variety superior to the existing variety of *mesta* in yield and quality of fibre.

W. Mohamed Alikhan and K. N. Muthiah

Out of the seven promising varieties of *mesta* under comparative yield trial all of them recorded higher yield over control. Among these "Amadala-

valasa" recorded the highest yield of 1660 kg/ha showing 86.5 per cent increased yield over the control, Ariyalur. Dry seeds of THC. 1 were subjected to gamma Irradiation (0, 60, 70 and 80 kr) and treated with chemical mutagen EMS (0, 20, 40, 60, 80 and 100 mM) to select superior plant types in the segregating generations.

R.1. Ag. Bot. 311 Evolution of germplasm stocks of sunnhemp (*Crotalaria juncea)*
W. Mohamed Alikhan and K. N. Muthiah

Sixty three varieties of sunnhemp were studied for morphological characters, duration and quantitative attributes like plant height, stem thickness, number of leaves per plant, wet weight of plant and fibre yield. In respect of wet weight of plant, 8 varieties recorded significantly higher weight over the others. The results of the nodulation studies showed that 27 varieties recorded significantly higher number of nodules over the others.

R.1. Ag. Bot. 312 Evolution of a sunnhemp superior to the existing variety in yield and quality of fibre
W. Mohamed Alikhan and K. N. Muthiah

Five promising varieties of sunnhemp viz., Bapatla local, Ayakkudi, S. T. 95, Belgaon and Chindwara were compared with Coimbatore Local as control. In respect of wet weight of plant 'Bapatla local' recorded the maximum yield showing 23 per cent increase over control and the variety 'Ayakkudi' registered 41 per cent higher yield of fibre over the check.

R.1. Ag. Bot. 314 Biometric studies in varieties of Sunflower
M. K. Ayyaswamy

One hundred and thirty two varities of sunflower in germplasm back were sown during *kharif* 1975 in three manurial levels viz., 20 : 30 : 20, 40 : 60 : 40 and 60 : 90 : 60 kg/ha of NPK. The flowering duration ranged from 40 to 74 days and theer was no difference among the manurial levels.

The biometric observations like height, number of leaves, stem girth, diameter of head and shape of head were recorded. In general convex shaped heads were found to be more in the varieties. The height of plant, number of leaves, diameter of head, stem girth and per plant yield ranged from 90 cm to 300 cm, 19 to 61 cm, 8 cm to 35 cm, 1.1 cm to 4.7 cm and 9 g to 248 g respectively. The lowest yield per plant was recorded by the variety 'Record' while the maximum yield by the variety E. C. 89096.

R.1. Ag. Bot. 315 Breeding rice varieties of high bran oil content
A. Subramanian and J. Chandra Mohan

A total of 33 rice varieties were screened for higher bran oil content during this year. The percentage of oil content varied from 1.20 to 3.5. The

varieties IR. 28, IR. 30, T_3 Basumathi, Jeeragasamba scented and nonscented Hamsa and Dawn were found to possess high oil content of above 3 per cent. The project was started in October, 1974 and so far 110 varieties have been screened.

R.1. Ag. Bot. 318 Evaluation and selection of lucerne varieties for high yields and nutritive value
M. Balasubramanian and A. Gopalan

The elite cultures of the last four year's trials, along with a few new entries were tried during this year to study their performance.

Two cultures viz., Anand-2 (selected) and Coimbatore gave 809 and 785 quintals/hectare/year of green matter.

A new strain with high yield potential, through mass selection technique, is in the final stages of evolution.

R. 1. Ag. Bot. 319 Evaluation of Cambu x Napier Hybrid Grass
M. Balasubramanian and A. Gopalan

Trials with 24 entries drawn from different parts of our country have been started. Two cuts have so far been taken and it was observed that eight entries are capable of out yielding the ruling variety N. B. 21 in green yield. The merit of these promising clones will be evaluated conclusively, after 8-9 cuts.

R. 1. Ag. Bot. 320 Evaluation of cowpea varieties for forage
M. Balasubramanian and A. Gopalan

In summer 1975, cowpea varites Anand-2 and C. 30 were outstanding yielding 225 and 213 q/ha of green yield, surpassing Co. 1 by 36 per cent and 30 per cent respectively.

In monsoon 1975 also, Co. 1 was outyielded by C.28 and C.14 both recording 160 q/ha green yield, an increase of 12 per cent Co. 1. However, all these three were an par.

R. Ag. Bot. 321 Evaluation of *Cenchrus* species under dryland condition (Rainfed)
M. Balasubramanian and A. Gopalan

Sixteen entries of three different species of rainfed grasses viz., *Cenchrus ciliaris* (9 entries), *Panicum antidotale* (4 entries) and *Setaria* species (3 entries) were tried under rainfed conditions. The total yield in a year showed that *Cenchrus* was outstanding (345 q/ha) followed by *Panicum* (280 q/ha) and *Setaria* (250 q/ha).

R. 1. Ag. Bot. 322 Creation of wide spectrum of variability in groundnut varieties through induced mutations for evolution of improved types
S. Sivasubramaniam

Thirtytwo high yielding mutant lines of POL. 1 that gave 21 to 50 per cent increased yields over the check varieties were under preliminary yield trials at Bhavanisagar and Coimbatore. Another fifty mutant lines of TMV. 10 were found to record increased yields twice as much as the control in row yield trials. Bold kernel types that may be suitable for export and testa colour varinnts to suit the market performance had been identified from the segregating generation.

R. 1. Ag. Bot. 327 Physiological studies in the available Genotypes employed for intervarietal crosses
S. Gopalakrishnan and P. S. Srinivasan

A total of 43 collections comprising six parents, sixteen buch, eleven semi-spreading and ten spreading varieties was screened for the soluble nitrogen and reducing sugar status of the groundnut leaf when the plant was under peakflowing phase. The values ranked themselves as a function of habit. Soluble nitrogen was 1.72, 1.87 and 2.87 mg/g in bunch, semi-spreading and spreading varieties while the corresponding values for reducing sugar was 17.0, 27.8 and 31.3 mg/g respectively. Reducing sugar values showed a greater degree of variation compared to soluble nitrogen.

Based on these findings the same 43 collection are being screened for a larger number of physiological characteristics at three phases.

R. 1. Ag. Bot. 333 Isolation of non-segregating derivatives of *G. hirsutum* cotton superior to MCU. 5
P. S. Chandramathi

Two cultures CP. 2/1 and CP. 13/20 which were very early with high ginning percentages of 40 and 35 respectively appear to be suitable for rice fallows. In addition, CPD-32-13 and CPD-11-3-8 were considerably earlier and completed harvests by 130 days.

R. 1. Ag. Bot. 334 Study of advanced cultures of *G. hirsutum* cottons for economic characters and resistance to pests and diseases
P. S. Chandramathi

The culture ELS 250 recorded the highest yield of 16 quintals per hectare as compared to 11 quintals for MCU. 5. This is the fourth year of its exhibiting superiorty over MCU. 5 in yield. But it is slightly inferior to MCU. 5 in spinning quality. The culture is now in district trials. ELS. 031, ELS. 139 and ELS. 103 were equal to MCU. 5 in yield and ginning percentage but possessed lower length.

One culture DS-1 appears to show a high degree of tolerance to jassids in the unprotected plot.

R. 1. Ag. Bot. 335 Evolution of a superior variety of Jute in yield and quality of fibre
W. Mohamed. Alikhan

Four jute varieties namely JRO. 878, JRO. 7835, JRC. 212 and JRC. 7447 were studied for their yielding ability along with RJO. 632 as the check. Among these, JRO. 878 was highly superior and registered 308 per cent increased fibre yield then check, JRO. 632.

Thirty germplasm collections belongingto *Corchorus capsularis* and *Corchrus olitorius* were studied. The *capsularis* types flowered in 65 to 85 days wereas olitorius types flowered in 31 to 90 days after sowing.

R. 1. Ag. Bot. 344 Studies on hybrid vigour, composites and evolution of male sterile lines in green gram
S. Krishnasami and R. Rathinasamy

Hybrid seeds obtained between cross combinations Co. 3 x Co. 2 and Co. 2 x Mutant 2 have been collected.

Four multi lines were constituted and they were tested for their yield performance over Co. 2. Multi line 2 has recorded an yield of 648 kg/ha representing an increase of 29 per cent over Co. 2.

R. 1. Ag. Bot. 347 Breeding for multiple resistance to pests and diseases and for field tolerence to adverse soil and climate conditions in rice
A. Subramanian and V. Sivasubramanian

This project was started during *Kharif* 1975 and a systematic hybridisation programme was formulated involving eight donor parents possing resistance to pests, diseases and adverse seasonal conditions, like Co. 4 for blast, TKM. 6 for blight and stemborer, Co. 20 for *Helminthosporise*, ASD. 7 for leaf hopper. IR. 28 for leaf roller, TKM. 1 for drought, Co. 18 for cold and PVR. 1 for salinity on the one hand and high yielding dwarf early rice varieties. IET. 1444, IR. 20 and IR. 28 on the other. Twenty four sets of crosses were effected involving the above varieties and resistant donor parents. A total of 13,460 spikelets were pollinated and the hybrid seeds will be collected for growing in the F1 progenies. Screening for resistance will be done from F2 generation onwards and progenies possessing individual resistance for a particular disease, pest or stress condition will be inter crosed in the F3 or F4 generation to incorporate multiple resistance in stages.

R. 1. Ag. Bot. 350 Evolution of improved pulses varieties with multiple resistance to pests, diseases and tolerance to advance soil and climatic conditions

P. V. Marappan, S. Iyemperumal, R. Veeraswamy, G. Soundarapandyan, R. Krishnaswamy, Gunasekaran, Vidhyasekaran and N. Natarajarathinam

Useful donors showing resistance or tolerance or less susceptibility to one or other pests and diseases were identified. They were S. 18 in redgram, No.55. AC. 282, AC.307, P.49, U.131, P.49, AC.211, AC. 221, AC. 222 and Warangal 1792 in blackgram, L. M. 220 in greengram and Radhey, Strain 76, T. 658 and PLS. 9 in bengalgram. These will be utiltsed in the hybridisation programme for imparting resistance to the adapted varieties under cultivation.

R. 1. Ag. Bot. 351 Evolution of improved groundnut strains with multiple resistance to pests, diseases and tolerance to adverse soil and climatic condition

V. D. Guruswamy Raja, R. S. Annappan, T. Ramanathan, S. Gopalakrishnan, E. V. Abraham and P. Narayanaswamy

The available germplasm collections (635) and other varieties were evaluated for diseases and pest resistance. Three types were found to be resistant to Rosette disease and 4 types for Mosaic disease. Thirteen varieties were observed to be drought resistant under artificial testing. One particular variety *Ah*. 8451 (TMV. 2 x erecta) was observed to be combining all the desirable attributes of pest, diseases and drought resistance.

R. 1. Ag. Bot. 352 Development of improved sesamum strain with multiple resistance to pests and diseases and tolerace to adverse soil and climatic conditions

V. D. Guruswamy Raja, N. Shanmugam, N. Sundaram, P. Sennaiyan and E. V. Abraham

Germplasm collections and otehr types under trails totalling 600, were examined for the resistance to the attack of diseases and pests. It was found that 13 types for powdery mildew diseases, 5 for Alternaria blight and 20 for phyllody disease were resistant.

NP. 6 and M 3-2 were observed to be free from the attack of pests like short webber and gallfly.

R. 1 Ag. Bot. 353 Development of improved sunflower strains with multiple resistance to pest and disease and tolerance to adverse soil and climatic conditions.

V. D.Guruswamy Raja, M.Stephen Dorairaj, S. Narasimhan, C. Ramakrishnan, J.Krishnarajan, and Vinodhini Vasudevan

The available germplasm collections numbering 132 were screened for impprtant pests, diseases and other economic attributes. Based on

the results, six promising types and varieties along with standards EC. 68413 and EC. 101495 were subjected to various tests. It is very interesting to note that one particular variety EC. 85820 possess 9 per cent higher yield, better oil content, tolerance to pests of jassids, grass hopper, white fly and rust disease.

The desirable performance of this variety EC. 85820 is being confirmed by further trails.

R1. Ag. Bot. 354 Breeding cotton varieties with multiple resistance to pests and diseases with tolerance to drought
S. Kamalanathan, S. D. Peter, M. Kadambavanasundaram A. bdul Kareem, Thangamani Narayanasamy and M. Thangaraj

A total of 360 genetic stocks of *G. hirsutum* and 45 genetic stocks of *G. barbadense* were raised under unprotected condition to screen them for different pests and diseases. Preliminary screening has indicated that among G. *hirsutum* varieties 84 are moderately resistant to *Alternaria* leaf spot disease and 3 varieties are moderately resistant to rust.

The varieties with known source of resistance to jassids and bollworms such as RS. 89, HB. 69, EC. 12400, 1301 DD and TH. 144 and for jassids and blackarm like Rebha-B. 50 were used as donar parents in crossing programmes with the strains MCU. 5, MCU. 6, MCU. 7, and MCU. 8.

A.I. Ag. Bot. 201 Incerporation of supperior plant type and hardiness for higher yield in cultivated rice through hybridization.
P. Chandarasekharan

Twenty three cuttures (majority of which are dwarf) were isolated in F5 of IR 8 X Chitraikar. These were found to be early maturing (105-120 days) and combined the yield potential of IR 8 with different genetic characters of Chitraikar, the rainfed rice. These are under rapid multiplication for trial in different parts of Ramanathapuram District.

Three hundred and thirty one F_3, 168F_4 and 26 F_5 selections were carried forward from the progenies of the crosses involving IR 8 and six semidry varieties. Sixty nine F_3, 103 F_4 and 83 F_5 progenies are being tested semidry conditions at Srivilliputhnr.

Study of 52 F_4 progenies of the triploid *O sativa* (4n = 48) X 0. *perennis* var. *barthii* (2n = 24) showed combination of characters ranging from the wild to the cultivated parent. Since the wild species is reported to be drought tolerant, an attempt has been made to screen 52 selected progenies by physiological tests and 14 have been found to be promising.

R.2. Ag. Bot. 203 Evolution of high yielding and indehiscent white seeded gingelly strain (*sesamum indicum.* L) With high oil content and drought tolerance.
N. Venkatraman, M. Rangaswamy, K. S. Paramasivan and G. Balasurbamanian.

A total of 84 single plants were selected from the F_2 progenies of 13 different cross combinations involving KRR 2, TMV 2 as well as 11 desirable varieties based on superior attributes. Seventy one multiloculed types were advanced from the M 2 population.

R. 2. Ag. Bot. 204 Studies on the improvement of bhendi suited to Madurai area through selection and breeding
N. Venkataramn, M. Rengasamy and V. Thandapani

Three selections. viz., MC 105 (Madurai), Co 1 and Shankarpalli were tested under yield trail with varity Pusa sawani as control. The selection MC 105 was found to be superior recording increased yield of 66.6, 13.8 and 3.1 percent over Co 1, Pusa sawani and Sankarpalli respectively. The crude fibre content of MC 105 was less (12.35 per cent) when composed to Pusa sawani (14.7 per cent) The level of incidence of vein Clearing disease in MC 105 was also less. This culture is in scatteted block trials.

Among the three back-cross combinationes in BCIF2, the combination (Exghana x Pusa sawani) x Pusa sawani was found to be superior with good set, bold fruits and desirable plant type. Six elite plants were selected from this combination for further yield trial.

R. 2. Ag. Bot. 205 Evolving superior mutants of *Capsicum* through induced mutagenesis
R. Sethupathi Ramalngam

The cluster flowering mutant (Cult. 1) has been tested along with two other mutant and control (k 1) under scattered block trials in 6 centres in Coimbatore, Trichy, Madurai and Pondicherry districts. Cult. 1 consistently recorded higher yield over k 1, the average for 6 centres being 20.9 per cent. Maximum yield by Cult. 1 was recorded in Dharmathupatti (Madurai district) recording 3700 kg/ha, increase being 31.8 per cent over K 1. Pre-release trials in 14 centres are in progress. Capasaicin content in Cult. 1 (0.70 mg/g) of day fruit compared with K 1 (0.45 mg/g).

R. 2. Ag. Bot. 206 Evolution of high yielding short and medium duration rice strains suited to the second crop season of Madurai.
P. Chandrasekharan and V. P. A. Rajasekaran

Ninety nine single plant selections in F_3 and 114 in F_4, involving direct and reciprocal crosses of IR 8 and IR 20 on the one hand and Ponni on the other, were advanced for further study.

R. 2. Ag. Bot. 207 Varietal improvement in groundnut (*Arachishypogaea* L) Evolution of superior strains by induced mutagenesis. P. Chandrasekharan and V. P. A. Rajasekaran

In M_2 generation, a total number of 642 progenies of groundnut strains, POL 1 and POL 2, treated with 15, 20, 25, 30, 35 and 40 kR of gamma rays, were under study. The pod setting was adversely affected due to heavy rains at the time of flowering and pod setting. Sixty three single plants were advanced for further study.

R. 2. Ag. Bot. 208 Evolution of short duration, non-season bound, high yielding strains in Red gram (*Cajanus Cajan* L. Mill sp.) R. Sethupathi Ramalingam and N. Sivasamy

In a study of yield assessment of 304 accessions, two selections viz., CC1 and S12 were found to record 11.1 per cent over SA 1 and 12.2 per cent over Co 2 respectively.

Populations in M_2 consisting of 29,500 plants of S 12 and 21190 plants of Co 2 were screened and 40 mutants possessing compact plant type and increased yield were advanced for further study. Gamma rays induced more economic mutants than EMS or DES.

R.2. Ag. Bot. 209 Evolution of high yielding, short duration castor suitable for southern districts of Tamil Nadu. N. Venkataraman, M. Rangaswamy and K. S. Jehangir

Seven single plants were advanced to M_5 from among 23 selections studied in M_4, based on superiority in attributes like plant type, earliness, size of spike and capsule and maximum number of female flowers per axil.

In M_2 generation, 24 in TMV 2 and 30 famililines in VHB 44 were studied with their respective standards and the selection work is in progress.

R.2. Ag. Bot. 210 Evolution of pest resistant, medium and short duration rice varieties through hybridization and selection. P. Chandrasekharan, K. S. Paramasivan and G. Balasubramanian

From the F_1 hybrids of the direct and reciprocal crosses between cultures and strains found to possess resistance to stem borer, gall-fly and leaf roller and high yielding strains like Kannaki, Bhavani, Co 36 and IR 8, ten F_2 familles were studied. Sixty single plants were advanced on the basis of resistance to pest under field conditions, general vigour and yield.

R.3. Ag. Bot. 201 Evolution of early and medium duration rice varieties S. Manmohanlal and K. Mohanasundaram

Under the early duration group, out of nine varieties studied during summer 1975, culture 5202 recorded the highest grain yield of 5909 kg/ha

registering 32 per cent increased yield over the standard Tiruveni. Under the medium duration group, out of nine varieties tried the standard IR. 20 recorded the highest grain yield of 5691 kg/ha followed by CR 12-178 with a hectare yield of 5174 kg.

R.3. Ag. Bot. 205 Evolution and selection of groundnut varieties under irrigated conditions
S. Manmohanlal and K. Mohanasundaram

During summer 1975, out of eight cultures tested, culture *Ah.* 8401-II-4 has recorded the highest yield of 3140 kg/ha followed by culture *Ah.* 8401 with 3077 kg/ha.

During *Kharif* 1975, out of 12 cultures tested, cultures 50-92-4-1 recorded the highest yield of 1930 kg/ha.

R.3. Ag. Bot. 207 Evolution of new hybrid sorghum for monsoon (*Kharif*) and summer seasons.
S. Manmohanlal and K. Mohanasundaram

Out of twenty hybrids tested during *Kharif* 1975, hybrid CSH. 6 has recorded the highest yield of 3474 kg/ha followed by SPH. 24 (3677 A x CS 3541) with 3468 kg/ha while the local *Sencholam* gave only 580 kg/ha.

During the same season out of twenty varieties tested along with local *Sencholam* the variety CSH. 5 recorded the highest yield of 3570 kg/ha followed by SB 1066 with 2802 kg/ha while the local *Sencholam* has given only 505 kg/ha.

R.5. Ag. Bot. 101 Evaluation of germplasm stock of groundnut
M. R. Sivaraman, G. Purushothaman, C. Surendran, V. P. A. Rajasekaran, N. Subbaraman, R. N. Chandrasekaran and C. Palaniswamy

A total of 333 bunch varieties including 15 new accessions were evaluated for their yield and other economic attributes in comparison with the standards POL. 1, POL. 2, TMV. 7 and TMV. 9. The variety *Ah.* 6669 (East Africa) was the earliest to flower on the 19th day after sowing. Twenty three varieties had recorded higher yields than the standards POL. 1, POL. 2, TMV. 7 and TMV. 9 on the basis of dry pods yield of 1000 plants. In respect of semi-spreading types a total of 183 types including 22 new accessions were evaluated along with the standards, TMV. 8 and TMV 10. 34 types yielded better than the checks.

R5. Ag. Bot. 201 Evolution of high yielding bunch groundnut strains superior to the existing ones
M. R. Sivaram, G. Purushothaman, C. Surendran, V. P. A. Rajasekaran, N. Subbaraman, R. M. Chandrasekaran and C. Palaniswamy

In the scattered block trial conducted with three bunch selections for the fourth year, the performance of these selections was inconsistent. However,

one selection *Ah*. 8189 (Junagadh) recorded the highest mean yield of 1546 kg/ha, registering a mean increase in yield of 6.3 per cent over POL. 2. Under comparative yield trial, two selections *Ah*. 8407 and Ah. 8435 recorded an yield increase of 44.5 and 20.7 per cent over POL. 2. One hybrid derivative *Ah*. 8451 gave numerically higher yield than POL. 2 registering an yield increase of 13.7 per cent. The hybrid derivative *Ah*. 8457 and the selection *Ah*. 8461 recorded an yield increase of 31.9 and 15.4 per cent over POL. 2 respectively. Seventeen selections revorded higher yield than POL. 2 in row test. *Five varieties* Ah. *7890, RS. 16, Ah. 7891, G. 64-838 and KG. 61-240* had given higher yields registering 48.6 per cent, 42.9 per cent, 31.0 per cent, 20.6 per cent and 12.7 per cent over POL. 2.

R.5. Ag. Bot. 202 Evolution of high yielding semi-spreading strains superior to the existing ones
M. R. Sivaram, G. Purushothaman, C. Surendran, V. P. A. Rajasekaran, N. Subbaraman, R. M. Chandrasekaran and C. Palaniswamy

Among the four cultures tested in the Comparative yield trial, one culture Ah. 8465 recorded the highest yield of 1458.2 kg/ha which was 17.8 per cent higher than strain TMV. 8. Out of the eleven semi-spreading entries tested under Co-ordinated Varietal Trial, the variety C. 501 recorded higher yield of 1412.2 kg/ha. registering an yield increase of 7.5 per cent over TMV. 8 (1313.98 kg/ha).

R.5. Ag. Bot. 203 Induced mutation in groundnut
M. R. Sivaram, G. Purushothaman, C. Surendran, V. P. A. Rajasekaran, N. Subbaraman, R. M. Chandrasekaran and C. Palaniswamy

A total number of 325 M_5 progenies of POL. 1 and TMV. 10 irradiated with X-ray (20, 40, 60 and 80kR) and with gamma ray (10, 20, 30 and 40 krad) were under study; of which 44 plants with more number of pods per plant, as well as bold and small sized pods were isolated. Six plants possessed red kernels as well as rose and varigated. 41,50 M_3 progenies of POL. 1, POL. 2 and TMV 10 irradiated with X-ray (20, 40. 60 and 80 kR) as well as the progenies of POL. 1, POL. 2, TMV. 2, TMV. 10 and Pollachi Red irradiated with gamma ray (10, 20, 30 and 40 krad) were studied. 286 plants possessing different desirable traits were selected for further study.

R. 5 Ag. Bot. 205 Evolution of short duration high yielding bunch groundnut strains by irradiation.
P. Sivasubramaniam, K. B. Anandakrishnan and S. Panneerselvam.

One family among TMV. 7 was observed to breed true for the puckered nature of leaves. As many as 714 single plant selections and 93 line selec-

tions in TMV 7 and 506 single plant selections and 60 line selections in TMV 8 were made for further study.

R. 5 Ag. Bot. 206 Seed multiplication and evaluation of progenies of crosses, cultures and varieties of groundnut from various participating centres under All India Coordinated Research Project on oil seeds

P. Sivasubramaniam, K. B. Anandakrishnan and S. Panneerselvam

During *Kharif* '75, a total of 47 entries of groundnut were compared with the strain POL 2 of which 25 entries under row trial were evaluated on the basis of 1000 plants yield and the rest in advanced yield trials. As many as 33 entries recorded higher yield than the standard. The two mass selections OSN 1 and OSN 2 were tested for the third year and they recorded consistently higher yields than POL 2, the average increase in yield being 17.2 per cent and 19.9 per cent respectively over the three years. During *Rabi* '75 as many as 46 entries of groundnut from seven participating cenlres were sown to seed multiplication under irrigated conditions at Aliyarnagar.

R. 8 Ag. Bot 201 Evoluation of high yielding rice varieties for Krishnagiri Reservoir Project area

N. S. Loganathan and R. Nagarajan

Studies showed that cultures 2501, TKM 6 mutant and 8244 were outstanding and topped the other selections and strains with yields of 4910 kg, 4004 kg and 3687 kg per hectare respectively, the percentage of increase being more than 20 over their respective controls in all cases. Cultures 131616 8241 and IET 2508 were also consistent and promising and registered yields of 3553, 3627 and 3412 kg/ha respectively. TKM-6 mutant, 2501 and 8244 were markedly superior to our existing strains. The performance of 8244 was consistent over a number of seasons.

R. 8. Ag Bot. 203 Evoluation of high yielding *ragi* strain suitable for rainfed tract of Dharmapuri District

N. S. Loganathan and R. Nagarajan

A varietal trial with 13 selections under rainfed conditions revealed that the highest yield was recorded by Sarada, which registered 10.65 kg/ha, the increased yield being 14.10 per cent over the standard Co. 10 (933 kg/ha). IE 28 which closely followed the highest yielder was the earliest in maturity (88 days) yielding 978 kg/ha (4.8 per cent over that of Co. 10). In terms of per day production, strain Sarada recorded 11.8 kg, while IE 28 and Co 10 registered 11.2 kg and 9.7 kg respectively.

R. 8 Ag. Bot. 204 **Developing high yielding short duration compact types of redgram suitable for rainfed cultivation**
N. S. Loganathan and R. Nagarajan

In a varietal trial, it was observed that S. 19 and S. 18 performed better than strain Co. 2 recording yields of 501 kg/ha and 468 kg/ha compared to 384 kg/ha of Co. 2, the percentage increase being 30.6 and 22.1 respectively. These two mutants did well at Coimbatore also indicating their consistency and high yielding potential.

R. 8 Ag. Bot. 205 Development of high yielding greengram, blackgram and cowpea varieties suitable for rainfed areas and rice fallows
N. S. Loganathan and R. Nagarajan

1. Greengram varietal trial (rainfed) revealed that selections M_1 & M_2 with a duration of 80 days were found to be high yielding and registered yields of 1040 kg/ha and 1017 kg/ha respectively, while PLS 367/2 with a duration of 65 days maintained its supremacy for short duration cultures with an yield of 770 kg/ha as compared to the standard Co. 2 which recorded 610 kg/ha, the increased yield being 26.40 per cent. In terms of per day productivity, M_1, M_2, PLS 367/2 and Co 2 recorded 13.00, 12.70, 11.85 and 9.40 kg respectively. PLS 367/2 one of the shortest duration varieties whose performance was consistent over a number of seasons gave an additional income of Rs. 320/ha over the standard Co. 2.

2. Blackgram varietal trial (rainfed) indicated that PLS 364 recorded the highest yield of 438 kg/ha closely followed by Co 2 (423 kg/ha), M 5 (420 kg/ha) and T 27 (400 kg/ha). PLS 364 exerted an edge over the standard Co. 2, the percentage of increase in yield being 3.6, while M 5, a promising mutation variety failed to click by just 0.8 per cent. PLS 364 did well during earlier season also showing its consistency.

3. Cowpea varietal trial showed that culture C. 152 with a duration of 70 to 75 days continued to hold its superiority over other selections and standard Co. 2 establishing its high yielding potentials. It recorded the highest yield of 1198 kg/ha as against 768 kg/ha registered by Co 2 thus recording an increased yield of 56.00 per cent and netting an additional income of Rs. 645/ha. CC. 170, JC. 10-72, K. 11 and PLS 370, which also recorded higher yield than the standard, were the earliest reaching maturity in 64 days. The productivity per day worked out to 16 kg for C. 152 and 9 kg for Co. 2.

R. 8 Ag. Bot. 206 Evoluation of short duration, high yielding strain of sorghum with good grain and fodder suitable for irrigated and rainfed area.
N. S. Loganathan and R. Nagarajan

The results indicated that CSH 5 held the first place in the grain yield (842.3 kg/ha), followed by culture 699 (759.5 kg/ha) and culture S B. 411

(746.0 kg/ha). Culture SPV. 9 out yielded all the selections and control recording 1341.1 kg/ha, while culture SPV 61 proved to be the second best with 697.9 kg/ha.

R. 8 Ag. Bot. 207 Identification of suitable variety of groundnut for growing under rainfed conditions
N. S. Loganathan and R. Nagarajan

In groundnut, POL 2 recorded the highest yield of 2053 kg/ha, closely followed by culture *Ah.* 8184 (2015 kg/ha), N. G. 268 and H. 2-14 (1987 kg/ha). With reference to TMV 7, the ruling strain in the tract, POL 2 registered 21.9 per cent extra yield while variety *Ah.* 8184 registered 19.7 per cent and N. G. 268 and H.2-14, 18.0 per cent additional yields.

R.9. Ag. Bot. 201 Uniform variety trial for early rice varieties (UVT 1 & IA)
K. M. Balasubramaniam and P. Narayanaswamy

Twelve entries from different sets of crosses having the total duration of 100 days were studied against ADT 31 and Kannagi in *Kuruvai* season, 1975 (June-September). The data indicated that none of the varieties recorded higher yield than the standard ADT 31 (6199 kg/ha). In another set of trial 17 entries having the total duration of 105 to 120 days were studied against Anupana, Cauvery, Ratna, Vaigai, Kannagi and ADT 31. Among the entries IET 3116 and IET 4554 registered the maximum yield of 4873 kg/ha and 4757 kg/ha; with a total duration of 109 days and 108 days respectively. The standard ADT 31 that recorded the highest yield in UVT 1 (a) registered only 4393 kg/ha with a duration of 110 days.

R. 9. Ag. Bot. 204 Preliminary Variety trial with short duration varieties of Rice (PVT 1)
K. M. Balasubramaniam and P. Narayanaswamy

Thirty five entries having the total duration range of 105 days to 115 days were compared for yield with ADT 31 as the standard. The crop was raised under a manurial schedule of 60 kg N + 26 kg P + 33 kg K/ha. Out of 35 entries studied, two entries viz. IET 2762 (TKM x IR 8) and IET 2742 (T. 712 x TN 1) x HR 35 recorded significantly higher yield of 5978 kg/ha; and 5694 kg/ha respectively with a total duration of 107 days. The standard ADT 31 recorded only 3302 kg/ha with a total duration of 107 days. These two cultures were earmarked for detailed tests under farmers holdings in the first crop season.

R. 9 Ag. Bot. 206 International Rice Observation Nursery (IRON). K. M. Balasubramaniam and P. Narayanaswamy.

A total uumber of 105 rice varieties from different countries were studied in order to identify varieties with broad spectrum resistance to major diseases, insects and other stresses. The varieties were screened for bacterial leaf blight white ear and leaf folder. In one entry from Indonesia,

viz; B. 1896-52-8-3-1 which scored the phenotypic rating (excellent) with broad spectrum to diseases and insects, selections have been made since it was segregating for duration and plant type, for further study.

R.10. Ag. Bot. 202 project study in Coconut
I. Hentry louis, T. K. Ramachandran and
N. R. Chandrasekaran.

Among the three progenies viz. Thambikkottai, Thiruthuraipoondi and Marungapallam, highest yield of nuts was recorded by Thiruthuraipoondi from clayey soil types followed by Thambikkottai

R. 10. Ag. Bot. 203 Study of semi tall types from Kanyakumari
K. Balasubramanian, C. Jayaraman and
N. R. Chandrasekaran.

Twenty palms of Semi tall yellow and 22 in each of semi tall green and red from Kanyakumari were evaluated. Of the three, semi tall green has put forth maximum growth and red the minimum. The mean yield of nuts is highest (per palm per year) in semi-tall yellow (91-3) followed by semi-tall green (69.0) and semi-tall red (57.0). The Eastcoast tall gave 91.1 nuts/palm year.

R. 10. Ag. Bot. 204 Calibration of existing adult palms in the Plantation.
C. Jayaraman, K. Balasubramanian and
N. R. Chandarasekaran

The performance data of the unthinned, thinned and transplanted plots for the past 6 years (1969-74) revealed that an yield increase of 522 nuts per hectare per year (8.5 per cent increase) was realised by thinning and that the transplanted palms fared exceedingly well recording an increased yield of 4110 nuts per hectare per year registering 67.1 per cent increased yield over the unthinned plot.

This study clearly reveals the first step in improving the yield level of the existing plantation is to thin them to about 175 palms per hectare.

R. 13. Ag. Bot. 201 Zonal varietal trial (Sugarcane)
K. V. Daniel and S. P. Chandra Sekharan

Among eight varieties under study during mid season (Feb-March) at Cuddalore, Co. N. 68075 recorded the maximum of 16.08 tonnes of sugar ha, followed by Co. 6304 with 15.94 tonnes of sugar/ha.

R. 15. Ag. Bot. 201 : Varietal trials in groundnut
A. N. Venkateswaran, T. K. Ramachandran, R. Stephen
Vinaya Rai and G. Srinivasan

Co-ordinated varietal trials in the *Kharif* season with 31 bunch varieties conducted for four years (1971-74) brought out Ex 1-1 as the top

yielder, recording the highest per day oil production and excelling TMV. 9 by 26.7 per cent. Varieties promising for various characters were also identified viz., 14-4 for high flower production, TMV. 9 and *Ah.* 6279 for high reproductive efficiency H2-14 for high shelling and Ex 1-1, 14-4 and RS 218 for high oil. The variety Gangapuri not only maintained its earliness by 10 days, but also yielded on par with the check TMV. 9 and fifteen other varieties indicating its potentiality for high yield under favourable seasonal conditions. Among semi-spreading varieties compared for five years (1971-75), TMV, 10 excelled all the others in per day oil production (4.02 kg/ha). Semi-spreading varieties identified for economic characters were Gujarat narrow leaf for high flower production and high shelling and RS 138 for high proportion of 3 to 4 pods. The spreading variety 4-16 has been identified as a high sheller with high oil content.

R. 15. Ag. Bot. 202 Initial yield evaluation trails in groundnut
A. N. Venkateswaran, T. K.Ramachandran, R. Stephen Vinaya Rai and G. Srinivasan

In the average of four years of yield trials (1971-74) with forty-two bunch varieties, the variety G. 0969 recorded the highest oil production per day of 6.3 Kg/ha, an increase of 23.3 per cent over the general mean. Among 31 spreading varieties G. 37 ranked first in per day oil production registering an increase of 12.1 per cent over the check M. 13 and 19.2 per cent over the general mean.

R. 15. Ag. Bot. 203 Hybridisation studies in groundnut
A. N. Venkateswaran, T. K. Ramachandran, R. Stephen Vinaya Rai and G. Srinivasan

In thirty four fresh crosses involving the bunch varieties Gangapuri (pureline) *Ah.* 8254, G. 0969, *Ah* 34, 14-4, Ex 1-1, EC-76446, *Ah* 8068, *Ah* 6279 and USA 86, the semi spreading varieties TMV, 10, *Ah* 7522 and RS 138 and the spreading varieties M_{13} and TMV. 4, a total of 20,000 flowers were crossed. Hybrid derivatives from 40 cross combinations were studied and 509 selections were made for further study. In the cross involving Gujarat "narrow leaf" is dominant over broad leaf and is monogenically inherited. Two white flowered plants were identified in the cross *A monticola A. glabrata*. The M_2 generation of TMV 9 arising from Gamma irradiation yielded variant from the original material with short plant type bold pods, small pods with thin shell, three seeded pods, tikka resistance etc. One tikka tolerant bunch extract of the cross *Ah* 6481 X S 206 put under seed multiplication-cum-evaluation trials significantly out-yielded TMV. 9 by 20 per cent. Four high yielding, highly tikka tolerant bunch cultures have been isolated from the cross TMV. 2 X *Ah* 7205 (Russia) in a preliminary yield trial.

R. 15. Ag. Bot. 204 **Compatative yield trials in groundnut**

A. N. Venkateswaran, T. K. Ramahandran, R. Stephen Vinary Raj, and G. Srinivasan

The two promising bunch cultures viz., *Ah.* 8253 (Ah 6279 x HG 1) and *Ah* 8254 (*Ah* 6279 x TMV. 3) evaluated under adaptive research trials at five research stations, recorded yield increases of 96.3 and 33.2 per cent respectively over the standard TMV. 9. In a varietal-cum-irrigation trial *Ah* 8254 recorded a high harvest index of 50 against the least (35.1) displayed by Gangapuri. *In an yield trial conducted in Kharif* 1975, Ah 8253 (1327 Kg/ha) and *Ah* 8254 (1308 kg/ha) gave significantly higher pod yield than TMV. 9 (1196 Kg/ha) and EX 1-1 (1141 kg/ha) and significantly higher kernel yield than RS 113, POL. 2, TMV and EX 1-1.

R. 15. Ag. Bot. 205 Maintenance of Genetic stock

A. N. Venkateswaran; R. Stephen Vinay Rai, T. K. Ramachandran ane G. Srinivasan

A collection of 220 bunch, 180 semi-spreading and 282 spreading varieties were maintained and evaluated in the genetic stock. Four highly tikka tolerant bunch varieties viz., Culiure 941, EC 20977; EC 76446 and USA 86 were identified.

R. 15. Ag. Bot. 206 Varietial trial in sesamum

A. N. Venkateswaran, T. K. Ramachandran, R. Stephen Vinay Rai, and G. Srinivasan

Thirteen mutants of KRR. 2 from the 114 generation were raised in replicsted row test during 1975 *Kharif* along with TMV 3 and KRR 2. TMT. 3 was the first to flower in 34.6 days. Among the mntants G 70-40-1-1, G 100-41-1-1, EMS 0.05-36-1-2 and EMS 0.05-26-5-1-1 were the next to flowor in 37.5 to 38.1 days. While TMV 3 yielded significantly higher than KRR. 2, the mutant EMS 0.05-36-1-1 yielded significantly higher than TMV. 3 by 26 per cent.

R. 16. Ag. Bot. 101 Maintenance of germplasm bank of castor

K. Navakodi, R. Muralidharan and N. Sundaresan

A through screening of the germplasm was made and certain inbreds with similar characters, i. e, duplicates were eliminated. Thus a germplasm bank of 220 inbreds comprising 40 short, 44 medium and 136 long duration types were sown Besides, 18 new varieties advanced from 1974 *Kharif* and two new varieties from Mizoram received through the Indian Agricultural Research Institute were also raised for study and maintenance. Purity of the inbred lines was maintained by selfing. Observations on morphological and economic attributes were made. Thirty one inbreds from the germplasm bank were utilised in the hybridization programme during 1975 *Kharif*.

R. 16. Ag. Bot. 201 **Breeding of early and uniform maturing types of caster**
K. Navakodi, R. Muralidharan and N. Sundaresan

None of the selections tested was found to maintain its superiority over the standard strain SA 2. All the 14 F_3 progenies were forwarded to Replicated Row Trial as line selections, as the progeny rows were uniform in morphology and fruit setting. The seeds of 10 F_1 population were collected for study of the segregating population in the next gemeration. Out of 20 crosses attempted between four long duration strains and five short duration strains and varieties, 13 crosses were successful and the hybrid seeds were collected.

R. 16. Ag. Bot. 202 Inducced mutation in castor
K. Navakodi, N. Sundaresan and R.Muralidharan

A close study was made on the segregating population of 28 M_2 progenies of the castor strain, SA 1, irridiated with X-rays and baaed on the morphological and some visual economic attributes, 11 plants were earmarked for detailed study in M_3 generation· Similarly, 39 desirable plants were selected from a segregating population of 52 M_2 progenies of castor strain, SA 1 irradiated with gamma rays and the seeds collected. Seeds of castor strains TMV. 1 and TMV. 2 were irradiated with six doses of gamma rays ranging from 55 Kr. to 80 Kr. and the seeds were collected for study in M_2 generation. The LD 50 was found to be between 75 kR. and 80 Kr. in both TMV. 1 and TMV. 2 castor strains.

R. 16. Ag. Bot. 203 Evolution of high-yielding hybrid castor
K. Navakodi, N. Sundaresan and R. Muralidharan

None of the twelve top cross hybrids tested in comparison with TMV 1 and TMV 2 proved superior to the standard TMV 2. Five successful top crosses involving R. C. 539/1 as pollen parent and five inbreds and strains as ovule parents were effected with a view to assess the general combining ability of the ovule parents with R. C. 539/1. In order to assess the general combining ability of inbreds with TMV. 1 100 per cent pistillate line, eight crosses were successfully effected. Seven separate crosses were made between 100 per cent pistillate line of TSP 10 R and JHP 435 and six other monoecious lines, so as to study their general combining ability. Out of ten double crosses attempted, nine came out successful.

R. 17. Ag. Bot. 204 Cereals as fodder *Jowar* K. 3 Vs Napier *Bajra* Hybrid 21 Vs wild teosinte (*Chionachne semi teres*)
K. Rajagopalan, K. Mahudeswaran and A. Ravindran

During 1975-76 *Rabi* season a replicated yield trial with *jowar* K. 3, NB hybrid. 21 and wild teosinte was laid out in randomised block. The initial stand was poor (26-30 per cent) due to continuous drought. The

mean fodder yield of sorghum K. 3, wild teosinte and NB. 21 was 7819 kg, 5050 kg and 10479 kg per hectare respectively.

R. 17. Ag. Bot. 205 Evaluation of Breeding materials/germplasm selection of promising mung (green gram) varieties
K. Mahudeswaran and A. Ravindran

During 1975-76 *Rabi* season a replicated trial was laid out with ten high yielding varieties sown on 23-10-75. The stand was good and ranged from 67-82 per cent. Except variety PM 71-1, all other varieties recorded good yields ranging from 102 to 412 kg per hectare. Co. 1 gave the maximum yield of 412 kg/ha of grain followed by M2 with 401 kg/ha.

R. 17. Ag. Bot. 206 Evaluation of Breeding materials/germplasm selection of promising urid (Blackgram) varieties
K. Mahudeswaran and A. Ravindran

During 1975-76 *rabi* season, a replicatad trial was laid out with 10 blackgram varieties on 23-10-75. The crop was harvested on 24-12-75. Selection PUA 1 gave 235 kg/ha of grain followed by variety musiri with 221 kg/ha and UPU. 2 with 207 kg/ha of grain yield respectively. Variety Alangudi recorded 180 kg/ha followed by PLS 364 with 183 kg/ha of grain yield.

R. 17. Ag. Bot. 208 Evaluation of breeding materials/germplasm selection of promising cowpea varieties
K. Mahudeswaran and A. Ravindran

In the year 1975-76 a trial was laid out with 10 cowpea varieties in replicated plots. The varieties were sown on 22-10-75 and crop harvested on 2-1-76. *Cowpea Co. 1 gave the maximum mean grain yield of 326* kg/ha followed by selection C. 153, EC. 4216, C. 152 and PLS. 370 yielding 229 kg, 195 kg and 190 kg/ha of grain yield respectively.

R. 17.Ag. Bot. 215 Breeding drought tolerant *G. hirsutum* varieties superior to Bharathi in yieid and quality
C. Nagarajan and O. Ramanatha Pillai

The selection C. 50 has proved its superiority over Bharathi being earlier than Bharathi by 10 days, drought tolerant with better vigour than Bharathi in this year of meagre rainfall of 59.9 mm in the crop period which is deficient by 166.4 mm compared to the normal rainfall for the period and tolerant to jassids with a resistance grade of 2 compared to 3 recorded by Bharathi in unprotected condition. The mean yield of this strain in the trials of the previous four years is 1091 kg/ha which is an increase of 21.8 per cent over 896 kg/ha recorded by Bharathi, giving an additional profit of Rs. 488/- per hectare over Bharathi.

R.17. Ag. Bot. 216 Development of superior hybrids of American cotton under rainfed conditions
C. Nagarajan and R. Kalimuthu

The intra-*hirsutum* hybrid T. K. X. 1 with an yield potential of 14 quintals of kapas/ha as against 7.5 quintal of Bharathi has been found to be earlier than Bharathi by 15 days.

R.17. Ag. Bot. 218 Search of resistance sources for jassid incidence on rainfed American cotton and breeding jassid resistant varieties
C. Nagarajan and R. Kalimuthu

The insecticidal trials in the two years from 1972 to 1974 have revealed that five dustings with carbaryl 10 per cent dust at fortnightly intervals commencing from the 50th day after sowing, combining sulphur dust at 2 : 1 proportion (Carbaryl : Sulphur) in the last round gives 53 per cent higher yield of kapas over unprotected control giving an additional profit of Rs. 287 per hectare.

R.18. Ag. Bot. 203 Study on the efficacy of chemical defoliants on the yield, earliness and quality of cotton
S. R. Chowdappan and U. Bangarusamy

An experiment with two chemical defoliants viz., bolls eye and paraquat at 2 and 3 litres per hectare, each in two stages of 60 and 80 per cent boll opening was conducted during summer 1975 under irrigated condition. Highest yield was obtained in the treatment receiving paraquat 3 litres per hectare at 80 per cent boll opening stage, and maximum defoliation was recorded in this treatment as against the control. The net profit of Rs. 207/- per hectare was obtained under paraquat at 3 lit/ha over the control.

R.18. Ag. Bot. 205 Breeding a *hirsutum* variety of cotton superior to MCU 8 suitable for summer cambodia tract of Tamil Nadu
S. Manmohanlal and S. Manivannan

Two cultures viz. ELO 631 and ELO 575 recorded significantly higher yield of the order of 17 per cent and 15 per cent respectively over that of the standard MCU 8 in the Preliminary Strain trial. In mean fibre length and ginning out-turn, they were on par with MCU 8.

R.18. Ag. Bot. 209 Varietal trials for introducing a suitable variety of cotton to replace MCU 7
M. Vaman Bhatt and R. Rajagopalan

In the Co-ordinated varietal trial conducted at Aduthurai, out of the 22 varieties tried against the standards Krishna and MCU. 7, 15 varieties were tried for 2 consecutive years and among those SVPR 75 recorded a mean lint yield of 450 kg/ha as against 372 kg/ha of MCU 7. It possessed a mean fibre

length of 26.4 mm as against 24.1 mm for MCU. 7. In other fibre properties, it compared favourably with MCU. 7.

R.19. Ag. Bot. 201 Rice improvement in Pondicherry region for short and medium duration varieties
S. R. Sree Rangasamy

Nineteen short duration varieties were tried in *Scrnavari*, '75 under Pondicherry conditions. In 90-95 days duration group rice varieties, Cult. TNAU. 6484 and 6523 recorded 5.10 and 5.26 t/ha. respectively while *Amaravahti* has given an yield of 4.96 t/ha. Among 105-110 days group *Triveni* yielded 6.83 and ADT. 31 yielded 6.33 t/ha. Cultures TNAU. 653 and 13613 recorded yields of 5.90 and 6.16 t/ha. respectively.

Twenty three rice varieties and cultures were tested in two experiments during monsoon, 1975. In the first experiment, 11 varieties of 145 days duration were tested. TNAU Cult. 4611 performed superior to the others with an yield of 4.67 t/ha. *Bhagavathi* was next in order recording an yield of 4.34 t/ha. *Bhavani* and IR. 20 recorded yields of 3.62 and 3.40 t/ha while *Ponni* gave an yield of 3.59 t/ha.

In the experiment with 145-165 days duration group, 12 varieties were tested. *Bhagavathi* yielded 4.91 t/ha. followed by Cultures 13493 and 13531 that have recorded each 4.69 t/ha. Co. 25, BCP. 1 and *Ponni* registered yields of 3.50, 3.50 and 3.43 t/ha respectively.

R.19. Ag. Bot. 205 Evaluation of blackgram varieties to suit different seasons and crop rotations
S. R. Sree Rangasamy

Performance of six varieties of blackgram was assessed under irrigated conditions. Varieties M5 and Killikulam yielded 1290 kg/ha and Co. 2, M4 and PLS. 364 registered yields from 1000 to 1050 kg/ha. M3 recorded an yield of 864 kg/ha and matured in 65 days.

2. AGRONOMY

R.1. Agron. 202 Nitrogen trial with short duration rice varieties
K. K. Subbiah and R. Ramaswamy

Eight rice varieties (Vaigai, IET. 2233, IET. 2508, IET. 1522, IR. 579, Telle Hamsa, Ratna and Kanchi) were compared with five levels of nitrogen (0, 40, 80, 120 and 160 kg/ha). It was found that IET. 1522 a cross between T(N)1 and TKM. 6 gave grain yield of 4730 kg/ha for 131.2 kg N/ha whereas to produce the same yield 168.2 and 201 kg N/ha respectively were required for Kanchi and Vaigai varieties, indicating that IET. 1522 requires less nitrogen than other varieties.

R.1. Agron. 203 Sources, timing and methods of nitrogen applicatio in short duration rice varieties under transplanted an or direct seeded conditions
K. K. Subbiah and R. Ramaswamy

Direct seeding of Co. 39 (Amaravathi) revealed that applying 60 kg N/ha as urea in three splits (¼th basal, ½ at tillering and ¼th at panicle initiation) gave the highest grain yield of 3790 kg/ha compared to the application of entire quantity of urea as basal (3290 kg/ha). The split application gave an extra monetary return of Rs. 750/ha than basal application. The application of sulphur coated urea (35.7 per cent N) as ½ basal and ½ at panicle initiation gave an extra monetary income of Rs. 1386/ha compared to urea application.

R.1. Agron. 221 Varieties, nitrogen dose and time of application on irrigated *cumbu*
S. Purushothaman and N. T. Jaganathan

Four *cumbu* varieties (HB. 3, UCV. 1, UCH. 1 and 126 D2A x MS 7625) under different levels of nitrogen (25, 50 and 75 kg/ha) in different split doses (basal alone, basal and tillering, basal and flowering and panicle initiation) were grown. The results indicated that hybrid UCH. 1 (2579 kg/ha) and the variety UCV. 1 (2429 kg/ha) recorded 36 and 28 per cent higher yield than HB. 3 cumbu (1894 kg/ha). There was no response for the higher levels of nitrogen and different spilt doses.

R.1 Agron. 239 Package of practices for irrigated cotton-effect of hormones – Cycocel
S. Sankaran

Application of Cycocel at 40 ppm on 65th day gave an average kapas yield of 1756 kg/ha compared to 1624 kg registered by control. The increase in yield due to Cycocel spray was 134 kg/ha valued at Rs. 536 as against an application cost of Rs. 41/ha.

R.1 Agron. 248 Manurial-cum-spacing trial on greengram
A. Subramanian and N. Balasubramanian

Seven manurial levels (0, 12.5 and 25 kg N, 0, 25 and 50 kg P/ha alone and in combination) and three spacing (25 x 5, 25 x 10 and 25 x 15 cm) were tried on greengram (Co 2). The two year study confirmed that the manurial level had no effect on yield. Among the spacings, 25 x 5 cm was superior to other spacings in giving an yield of 828 kg of grain/ha indicating that a populatian of 8,00,000 plants per hectare is necessary for higher yields.

R. 1. Agron. 249 Manurial cum spacing trial on Blackgram
A. Subramanian and C. Venkatachalam

Seven manurial levels (0, 12.5 and 25 kg N and 0, 25 and 50 kg P/ha alone and in combination) and three spacings (20 x 10, 20 x 15 and 20 x 20 cm) were tried on blackgram (Co. 2). The two year study confirmed that the

application of 25 kg P/ha alone was sufficient and recorded 865 kg of grain/ha. Among the spacings 20 x 10 cm gave a population of 5,00,000 plants/ha recorded the highest grain yield of 884 kg/ha.

R. 1. Agron. 253 Adaptability trial on sugarbeet (*Beta vulgaris*)
S. Michael Raj and P. Rajendran

Maribo magnopoly and Maribo resistopoly with five dates of dates of sowing (1) October 1st, (2) October 16th, (3) November 1st (4) November 16th and (5) December 1st were grown during 1973 and 1974. The results indicated that October 1st sowing gave 82,870 kg tubers/ha followed by October 16th sowing (79,931 kg/ha).

R. 1. Agron. 256 Fertilizer experiment on sesamum (NPK requirement)
P. Sennaiyan and L. Arunachalam

Three years trial on sesamum TMV 3 under rainfed conditions recorded the maximum yield of 441 kg of seed/ha for 25 N plus 25 P kg/ha which was 25 per cent increase over control amounting to a net profit of Rs. 115/ha. Under irrigated conditions TMV. 3 recorded the maximum yield of 705 kg of seed/ha for the application of 50 N plus 25 P plus 25 K kg/ha registering an additional yield of 276 kg/ha over control with the net profit of Rs. 680/ha.

R. 1. Agron. 257 Spacing cum fertilizer trial on sesamum
P. Sennaiyan and L.Arunachalam

Three row spacings (25, 35 and 45 cm), three plant spacings (15, 20 and 25 cm) and three fertilizer levels (25:25:0; 50:50:0 and 50:50:25 NPK kg/ha) on TMV 3 sesamum revealed that the spacing of 35 x 15 cm was significantly superior to other spacings recording a maximum yield of 455 kg/ha under rainfed conditions. Fertilizer levels were not significant.

R. 1. Agron. 260 Determination of nitrogen application for sorghum hybrids and varieties
SP. Palaniappan and A. Balasubramanian

Three hybrids (CSH 1, CSH 5 and CSH 6) and two varieties (168 and CS 3541) were compared with four levels of nitrogen 0, 40, 80 and 120 kg/ha under rainfed conditions. The results revealed that CSH 5 and CSH 6 were on par recording significant higher grain yields of 4968 and 4919 kg/ha respectively over CS 3541, CSH 1 and 168 yielding 4213, 3524 and 3367 kg/ha respectively. There was no difference between different nitrogen levels.

R. 1. Agron. 261 Studies on plant density for dry sorghum
SP. Palaniappan and A. Balasubramanian

Sorghum hybrid UCH 1 and varieties 699 T and CS 3541 were grown under four different spacings (45 x 12 cm, 60 x 9 cm, 90 x 6 cm and 120 x 4.5 cm) under dry conditions. The variety CS 3541 gave the maximum grain yield of 4866 kg/ha and superior to UCH 1 and 699 T yielding 4124 and 3957

kg/ha of grain respectively. The spacing of 45 x 12 cm was found to be optimum for all these varieties. In respect of straw yield UCH 1 recorded the maximum yield of 8835 kg/ha.

R. 1. Agron 262 Intercropping with pulses
SP. Palaniappan and A. Balasubramanian

Sorghum hybrid CSH 1 was raised with 60 x 9 cm spacing along one row of intercrops viz., Cowpea (C 152), greengram (Co 2), blackgram (Co 2) redgram (Co 2), groundnut (POL 2) and lab-lab (Co 8). A maximum net profit of Rs. 7515/ha was obtained when sorghum was raised as a pure crop. Among the intercrops a maximum net profit of Rs. 6117/ha was obtained when sorghum was raised with soybean and it was followed by sorghum with lab-lab (Co 8) which gave a net return of Rs. 6016/ha.

R. 1. Agron. 263 Determination of the effective herbicide for weed control in *cumbu*
A. Mohamed Ali and V. K. Balakrishnan

In direct sown *cumbu* (HB 3) pre-emergence and pre sowing method of application of Atrazine recorded grain yield of 1191 and 1144 kg/ha respectively as compared to 783 kg/ha under post-emergence application of 2, 4-D. The profit recorded under the application of Atrazine as pre-emergence at 0.375 kg a.i/ha was Rs. 133/ha over normal weeding.

R. 1. Agron. 268 Selection of an effective herbicide for weed control in greengram
P. Rethinam and N. Sankaran

Five herbicides (Terbutryn, Alachlor, Dichlormate, Nitrofen and Basalin) were tried on greengram as pre-emergence spray and compared with hand weeding, Alachlor at 1.5 lit a.i/ha controlled the weeds effectively with the maximum seed yield of 1008 kg/ha followed by hand weeding (949 kg/ha The cost of weed control with Alachlor was Rs. 110 and that of hand weeding was Rs. 125/ha. Hence it is suggested to use Alachlor at 1.5 lit a.i/ha for profitable weed control.

R. 1. Agron. 269 Determination of optimum manurial cum spacing requirement for cowpea.
A. Subramanian

The optimum phosphate as well as spacing requirement for a new selection of cowpea (C. 152) was determined with six levels of phosphate (0, 25 and 50 kg as soil, 12.5 kg as foliar, 12.5 kg soil plus 12.5 kg as foliar and 25 kg as soil plus 12.5 kg foliar per hectare) and three levels of spacings (50 x 10, 50 x 15 and 50 x 20 cm). Soil application of 25 kg P/ha (1863 kg of grains/ha) was found to be on par with 50 kg P/ha as soil as well as 25 kg P as soil plus 12.5 kg P/ha as foliar. Among

the spacing 50 x 10 cm was superior to other spacings tried which registered a grain yield of 1824 kg/ha.

R. 1. Agron. 270 Determination of effective herbicide for weed control in cowpea

A. Mohamed Ali, V. K. Balakrishnan and K. Venugopal

Trials conducted in four seasons with cowpea (Co. 2) showed that pre-emergence application of Prometryne at 1.0 kg a.i/ha and Terbutryn at 0.75 kg a.i/ha had greater effect of control in weed growth than Alachlor and Nitrofen at 1.5 kg a.i/ha with yield of 1117, 954, 844 and 856 kg/ha respectively as against 951 kg/ha for one manual weeding. A profit of Rs. 129 in Terbutryn and Rs. 454 in Prometryne were recorded over one manual weeding.

R.1. Agron. 273 Chemical weed control in groundnut

R. Kulandaivelu and A. Damodaran

Alachlor at 1.5 l a.i/ha applied as pre-emergence spray on POL.2 groundnut gave the maximum yield of 2743 kg/ha of pods. The cost of weed control by Alachlor was Rs. 127.50/ha whereas by hand weeding it was Rs. 150/-. Using Alachlor at 1.5 l a i ha was cheaper by Rs. 22.50/ha.

R.1. Agron. 281 Studies on optimum time of sowing in sunflower

J. Krishnarajan and D. Sivasankaran

The sunflower variety E.C. 68413 sown 8-8-75 recorded the maximum yield of 1990 kg/ha followed by the 25-7-75 sowing recording an yield of 1645 kg/ha of seed.

R.1. Agron. 285 Studies on the manurial and cultural treatments on duration of cotton

T. R. Srinivasan

The effect of different spacings and population in relation to level of nitrogen fertilisation on durations of MCU. 5 cotton, was studied for the second time during 1974-75 winter season. The results of two years indicated that by adopting skip row planting, no change in yield was seen. Increased population by adopting 75 x 20 cm with three seedlings per hole gave the highest yield of 2057 kg of cotton kapas/ha. Adopting 75 x 20 cm spacing with three seedlings per hole resulted in a saving of about 15 days in duration.

R.1. Agron. 288 Determination of suitable multiple and relay cropping in wetlands

SP. Palaniappan and D. R. Thirunavukkarasu

Four series of crop rotation viz., rice-rice-rice, rice-rice-cotton, rice-rice-greengram and rice-rice-blackgram were raised with recommended

fertilizers during 1973-75. It has been found that rice (Bhavani)-rice (Kannaki)-rice (IR. 20) was the best giving an average net income of Rs. 8752/ha at the prevailing market price with a net profit of Rs. 25.55 per day per hectare.

R.1 Agron. 289 Determination of suitable multiple, relay and mixed cropping in garden lands
SP. Palaniappan and D. R. Thirunavukkarasu

Four series of crop rotation viz. cotton-cotton plus *bhendi* (mixture), cotton-maize-wheat, cotton-sorghum-sorghum (ratoon) and cotton-sorghum-*ragi* were raised with recommended level of fertilizers during 1973-'75. Cotton (PRS.72)-cotton (MCU.5) plus *bhendi* (Pusa Sawani) mixture gave the maximum net return of Rs. 12, 723/ha with a net income/day/ha of Rs. 37.97 during 1973-'74. The rotation of cotton (MCU.5)-sorghum (CS. 3541)-*ragi* (Co. 10) was found to give an income of Rs. 6250/ha with a per day per hectare income of Rs. 18.10 during 1974-'75.

R.1. Agron. 308 Fertilizer cum population density study in sunflower
J. Krishnarajan and D. Sivasankaran

Three spacings (30 x 15, 30 x 22.5 and 30 x 30 cm), three nitrogen levels (O, 45 and 60 kg N/ha) and three phosphate levels (O, 45 and 60 kg P/ha) were tried on E.C. 101495. Potash was applied at the rate of 40 kg K/ha as a basal dose to all the plots. It is recommended to adopt a spacing of 30 x 30 cm, 45 N, 60 P and 40 K kg/ha for E. C. 101495 sunflower.

R. 1. Agron. 310 Foliar nutrition of phosphate and potash in cotton
S. Sankaran and N. Balasubramanian

The study on the influence of time and method of phosphate and potash application on MCU.5 cotton revealed that application of phosphorus and potash in splits i.e. half of the quantity as basal, 1/4 as top dressing at square initiation and 1/4 th as foliar spray increased the yield of cotton significantly (2448 kg/ of kapas/ha) over normal soil application (2238 kg/ha).

R.1. Agron. 313 water requirements of sunflower
R. Kaliappa

The yield data showed that irrigation at 60 per cent available moisture treatment gave the highest yield of 2215 kg/ha. The total water consumed was 522 mm in 12 irrigations.

R.1. Agron. 317 Variety cum date of harvest trial on *mesta* (*Hibiscus cannabinus*)
M. R. Iruthayaraj and P. Rajendran

The pooled data of 1973-1975 revealed that harvest at green pod stage gave significantly higher fibre yield (20.09 q/ha) than harvest at full

maturity stage (18.76 q/ha). Among the varieties AMC. 108 gave an yield of 20.91 q/ha followed by H. C. 269 (20.30 q/ha). Growing the crop during May was found to be best for higher fibre yields.

R. 1. Agron. 318 Variety cum fertilizer trial on sunnhemp
M. R. Iruthayaraj and P. Rajendran

Six varieties (K. 12 yellow, K. 12 black, Chindwara, S. J. 67-42, S.J. 67-34 and local) with two levels of P and K (O and 40 kg/ha) were tried during 1973-75. The pooled data revealed that the application of 40 kg P/ha gave significantly high fibre yield of 1.32 q/ha. The application of potash alone or in combination with phosphorus reduced the yield of fibre by 0.38 and 0.14 q/ha respectively. Among the varieties, Bapatla local recorded the maximum fibre yield followed by S. J. 67-34 and Chindwara.

R. 1. Agron. 320 Varietal cum manurial and spacing trial on sugar beet (*Beta vulgaris*)
S. Michael Raj and P. Rajendran

Two years data (1973-74 and 1974-75) revealed that Maribo resitopoly (60.5 t/ha) was superior to Maribo magnopoly (55.3/ha). Sucrose content and yield were higher under closer spacing (40 x 20 cm) and at 120 kg N/ha in both the varieties.

R. 1. Agron. 321 • Study on foliar nutrition of nitrogen in cotton (MCU.7)
T. R. Srinivasan

The trial conducted from February to June during 1974 and 1975 with levels, time and mode of nitrogen ranging from O to 60 kg/ha indicated that there could be a saving of 15 kg N/ha by resorting to foliar application of nitrogen on 45 th day with an additional income of about Rs. 1507/ha.

R.1. Agron. 322 Water requirement for summer cotton MCU.7
R. Kaliappa and K. V. Selvaraj

Irrigating at 20 per cent available moisture using 743.6 mm of water including rainfall gave a significant yield of 2243.51 kg of cotton kapas/ha in MCU. 7. Topping on 90 th day after sowing was significant and gave an yield of 2318 kg of kapas/ha.

R.1. Agron. 323 Study on transplanting and direct sowing of sorghum, *cumbu*, *ragi* and cotton
SP. Palaniappan and R. Ramaswamy

Transplanting in sorghum decreased the grain and straw yield significantly. For *cumbu*, transplanting is advantageous especially with seedlings from manured nursery and it saved about 10-15 days time in main field. Increased income due to transplanting was about Rs. 500/ha. In *ragi*, transplanting and direct sowing were statistically on par.

R.1. Agron. 326 Varietal tolerance of rice to herbicides
A. Mohamed Ali

In direct sown rice, post-emergence application of Propanil at 3.5 l a.i/ha caused mild chlorosis in Karuna, Co. 36, Krishna, Vaigai, IR. 8,

Kannaki, TKM. 6, Cauvery, ADT. 27 and GEB. 24 and severe chlorosis in PTB. 10, ASD. 5, BAM. 3, Bhavani, IR. 5, Jagannath, Pennai, Bala, IR. 22 and IR. 20. In both cases, the plants recovered from chlorosis within 10 days after application.

R.1. Agron. 327 Studies on the efficiency of herbicides in semi dry and wet sown rice
S. Sankaran and A. Mohamed Ali

In direct seeded rice varieties Vaigai, IR. 20 and Bhavani, pre-emergence application of C. 288 at 0.75 kg a.i/ha and post-emergence application of Propanil at 3.0 l a.i/ha were effective and recorded 3843 and 3886 Kg/ha respectively as against 3286 kg/ha in unweeded control.

R.1. Agron. 331 Studies on the effect of minimal tillage with weed control in paddy
T. K. Gopal Rao

The experiment on IR. 20 rice revealed that the working of the cultivator under dry condition followed by cooper ploughing recorded the maximum yield of 3282 kg/ha of grain. Among the hand weeding and herbicide treatments, hand weeding recorded the maximum yield of 3892 kg/ha followed by Stam F.34 at 3.0 l a.i/ha with an yield of 3281 kg/ha of grain.

R.1. Agron. 333 To study the efficiency of *Azotobacter* in cotton production var MCU. 5
S. Sankaran and T. N. Balasubramaniam

Treating the seed or soil with *Azotobacter* culture was superior to no treatment. Treating cotton seed with the culture and broad-casting and mixing the culture in the soil before sowing saved 25 per cent of fertilizer nitrogen (15 kg N/ha) for the crop. The yield obtained under 75 per cent recommended N with *Azotobacter* treatment was equivalent to the yield recorded under 100 per cent recommended nitrogen without *Azotobacter*.

R.1. Agron. 335 To study the efficiency of NAA on boll retention in cotton MCU. 5
S. Sankaran and N. Balasubramanian

Application of 30 ppm NAA at initiation of flowering followed by 20 ppm spray 15 days after first spray with Planofix was found to be efficient in retaining bolls and increased the yield of kapas (2000 kg/ha) as compared to water spray (1634 kg/ha). Application of NAA in the form of Fruitofix was inferior to Planofix at all the concentrations of NAA tried.

R.1. Agron. 337 Package of practices for CBS. 156 cotton
A. Chamy and K. Venugopal

August first fortnight sowing consistently registered high yield of kapas 2872 kg/ha as against 532 kg/ha recorded with second fortnight

September sowing. Topping in general had no significant effect on the yield. Cycocel at 40 ppm sprayed on 60th day significantly reduced the yield of kapas. Eighty kg/ha of nitrogen was found to be sufficient during winter season. Ratoon crop of CBS. 156 on an average recorded 14 q/ha of kapas as against 28 q/ha for planted crop.

R.1. Agron. 338 Studies on the response of hybrid cottons to spacing and manuring
A. Chamy and K. Venugopal

To determine the optimum spacing and manurial requirements of CBS. 156, H2, and H3, two spacings (90 and 120 cm between rows with a common interrow spacing of 60 cm) and three levels of nitrogen (60, 90 and 120 kg N/ha) were tried. The results showed no significant difference in yield between varieties and H3 recorded numerically highest yield of 1742 kg of kapas/ha. The 90 x 60 cm spacing with 90 kg N/ha recorded the highest yield of 1873 kg of kapas/ha.

R.1. Agron. 339 Studies on the effect of nitrogen, doses, spacing and method of planting on hybrid cotton CBS. 156
A. Chamy and S. Shanmugasundaram

Nitrogen, spacing and methods of planting were studied on CBS. 156 cotton during 1974-76 winter season. Nitrogen manuring had significant effect on the yield over no manure but no yield differences were obtained between the doses of 40, 80 and 120 kg N/ha tried. Under 75 and 90 cm between rows, skip row planting registered significantly higher yield of 1891 Kg of kapas/ha over conventional method of planting in single row.

R.1. Agron. 342 Determination of optimum time of sowing in *Capsularis* and *Olitorius* jute
M. R. Iruthayaraj and P. Rajendran

The best time of sowing for JRC. 212 was 16th March recording an yield of 15.15 quintals of fibre/ha. In the case of JRO. 632 the best time of sowing was 16th April recording 13.40 quintals of fibre/ha.

R.1. Agron. 343 Study on the control of *Solanum elaeagnifolium*
A. V. Rajan and S. Balu

Five herbicides viz., 2, 4-D (2.0 kg a.i/ha), Bromocil (20 kg a.i/ha), Picloram (5.0 kg a.i/ha), San H. 9789 (20 kg a.i/ha), and Dicamba (5.0 kg a.i/ha) individually and in different combinations were tried. Picloram and San H. 9789 were also tried at different times of application viz., before 8 a. m., mid day 12.00 - 1.00 p. m. and after 5 p. m. and also with various additives like sugar, urea and potassium nitrate at 3 and 5 per cent levels, Picloram controlled the weed growth for 180 days and San H. 9789 caused severe chlorosis and formation of pink coloured weeds. None of

the combinations were found superior to individual herbicides. Also there was no difference of between the times of application of herbicides and no additional advantage by the addition of different additives.

R.1. Agron. 344 Package of practices for tumeric
P. Rethinam and N. Sankaran

Growing *bhendi* as intercrop with tumeric recorded a maximum yield of 13.1 t/ha of raw turmeric rhizomes and 16 t/ha of *bhendi*. Intercrops like maize and *ragi* affected the turmeric yield by 40-60 per cent of that of pure crop.

R.1. Agron. 347 Effect of border rows on grain yield in sorghum manurial experiments
M. Murugesan and A. Arokiaraj

The performance of border rows of CSH. 5 variety with 0 and 100 Kg N/ha and surrounded by 0, 50 or 100 kg N/ha was studied. The first border row of an untreated plot showed significantly higher yield than the remaining rows when the untreated plot was surrounded by 100 kg N/ha. The yield of first border row of the plot receiving 100 kg N/ha was significantly lower than the inner row.

In another experiment conducted with three varieties of sorghum with different stature viz., CSV 4 (short), CSH 5 (medium) and COH 2 (tall) under two nitrogen levels viz. 0 and 100 kg/ha, the grain yield of border rows were not significantly different from the centre rows in CSV 4 or in CSH 5 when either of these two varieties were surrounded by the other two varieties in the adjacent plot under no nitrogen and/as well as 100 kg N/ha. In COH 2 yield of first border row was 38 per cent and 67 per cent higher than the centre rows in the plots receiving 100 kg and 0 kg N/ha and also surrounded by 0 and 100 kg N/ha in the adjacent plots respectively.

R. 1. Agron 352 Water requirement for tapioca in relation to different levels of nutrients
R. Kaliappa and K. V. Selvaraj

Irrigation at 60 per cent available moisture recorded the maximum yield of 24,591 kg of wet tuber/ha using 1907.1 mm of water in 31 irrigations. There was no difference in yield for the application of recommended dose of N, NP and NPK.

R. 2. Agron. 203 Comparison of different methods of weed control on transplanted rice
S. Rajaram and K. Natarajan

The experiment was conducted during 1975 *Kharif* season on transplanted rice Bhavani with Butachlor, Stam F. 34 and Sirmate alone and in combination with one hand weeding and also pre-emergence herbicide com-

bined with post-emergence herbicide Stam F. 34. The results showed that the highest yield of 5142 kg/ha was recorded with Butachlor followed by one hand weeding.

R. 2 Agron. 211 Fixing suitable high yielding paddy strains for double cropping in Periyar tract.
M. Subbarayalu and V. Thirumurugan

During the first crop season of 1975, four short duration varieties viz., Kannaki, Vaigai, ADT 31 and Co 39 were raised under two manurial levels viz., 80:40:40 and 100:50:50 of N, P and K in kg/ha. The results showed that the treatment difference were significant for varieties alone. Kannaki recorded the highest grain yield of 6007 kg/ha which was on par with Vaigai and ADT 31 recording 6000 kg and 5997 kg/ha respectively.

R. 2. Agron 212 Time of sowing trial in rice.
J. B. Robinson and A. Paulchamy

Two short duration varieties, Kannaki and Vaigai were sown at weekly intervals on the 20th and 27th May; 3rd, 10th, 17th and 24th June, 1975 using two seed rates viz., 45 and 90 kg/ha under a manurial schedule of 100: 50:50 kg N, P and K per hectare. The treatment differences were significant for dates of sowing alone. June 24th sowing recorded the highest yield of 7134 kg/ha.

R. 3. Agron. 215 Production potential experiment
K. N. Chinnaswami

Four crop sequences viz., rice-rice-groundnut, rice-rice-rice, rice-groundnut-*bajra*, rice-rice-*jowar* were studied with the object of obtaining highest production per unit area in unit time. rice-rice-rice with 314 cropped days gave the highest production of 18,145 kg of grain/ha recording per day production of 57.8 kg/ha. The next best sequence was rice-rice-*jowar*. This sequence with 300 cropped days produced 13,277 kg of grain/ha which gave a per day production of 44.3 kg/ha.

R. 3. Agron 218 Manurial requirement of a fixed crop rotation
K. N. Chinnaswami

The effects of three levels of phosphorus (0, 30 and 60 kg P/ha) two levels of potash (0 and 30 kg K/ha) and two levels of FYM (0 and 15 t/ha) were studied on COH 2 *Jowar* during *Kharif* 1975-76. Response for phosphorus was noted at all levels of phosphorus application. The yields obtained at 0, 30 and 60 kg P/ha levels were 1144, 1881 and 2207 kg/ha respectively. There was no response for potash application. There was increase of 775 kg/ha of grain due to the application of 15 t/ha of FYM over no FYM.

R. 3. Agron. 219 Efficiency of potassium schoenite as a source of potassium on rice.
K. N. Chinnaswami

Pottassium schoenite an indegenous potassic fertiliser was compared wiih p otassium chloride and potassium sulphate at 40, 80 and 120 kg K/ha as sources of potassium on rice. There was no significant difference on rice yields between the sources and levels of potassium.

R. 3. Agron. 221 Nitrogen economy through organic manures
K. N. Chinnaswami

A field trial was initiated during *Kharif* 1974-75 with the object of achieving savings if any, in the use of inorganic fertilisers with the substitute use of organic manure (FYM). Treatments involving FYM alone and FYM in combination with inorganic manures (at total of 60 kg N/ha levels) recorded significantly lower grain yields than the treatments getting inorganic fertilizers alone (60 kg N/ha). During *Rabi* 1974–75, three levels of nitrogen viz., 30, 60 and 90 kg/ha were introduced as sub-plot treatments and applied as urea. During this season the residual effect of organic manure was not felt and higher yields were obtained at 90 kg N/ha followed by 60 kg N/ha. A uniform dose of 30 kg N /ha as urea was applied to all plots during *Kharif* 1975–76. The treatment differences were not significant. The cumulative effect of FYM was also not felt.

R. 4. Agron. 201 Trial on fertilizer requirement of groundnut (POL 1) in the Parambikulam Aliyar Project Area
K. Narayanan

The trial was laid out for fourth year of study to assess the optimum dose of fertilizers for groundnut crop (POL. 1) in Parambikulam Aliyar Project Area and to study the interaction effect of NPK with borax and lime, the results revealed that application of 15:30:45 kg of NPK per hectare was sufficient for groundnut in Parambikulam Aliyar Project area. There was no significant effect due to application of borax and lime.

R. 4. Agron 202 Irrigation trial on groundnut during different phases of crop growth and its effect on yield and pod character
K. Narayanan

The trial was laid out with four levels of irrigation at 0 (no irrigation) 6, 12 and 18 days intervals involving two phases of growth viz., vegetative and pegging period (upto 72 days) and pod formation and maturity period (from 73 to 108 days) and the results revealed that the irrigation once in 12 days during vegetative and pegging phase and once in 6 days during pod formation and maturity phase was found to be optimum for groundnut recording consistently the maximum Yield (1742 kg/ha).

R. 4. Agron. 204 Trial on the evaluation of suitable cropping pattern for the Parambikulam Aliyar Project area under rainfed and irrigated condition
K. Narayanan

The third year results showed that when water is available in the second season, under garden land condition, rice in the second season preceded by groundnut in the first season (rainfed) yielded a net profit of Rs. 8228.21/ha/ year in comparison with MCU 5 cotton in the second season (irrigated) and groundnut (rainfed) in the first season (Rs. 4407.25/ha/year).

R. 8. Agron. 201 Evolving suitable package of practices for *ragi* under rainfed conditions
V. Subramaniam and K. Palaniswamy

Ragi varieties Co. 7 and Co. 10 were raised under rainfed condition to study their fertilizer requirements. Under the two levels of fertilizer NPK tried viz,. soil test recommendation (45:19:10 kg NPK/ha) and blanket recommendation resulted in significantly high grain yield (4463 kg/ha) compared to soil test recommendation (1823 kg ha.). Both the varieties behaved in similar manner in giving high yields for the blanket recommendation. Thus in soil of sandy to sandy loam texture with high percolation as found in this station (Kaveripattinam), *ragi* may be fertilised with a higher dose of fertilizer viz., 90:45:45 kg of NPK/ha for securing higher yields.

R. 8. Agron. 202 Studies on fertilizer response of sorghum and recommending suitable package of practices under rainfed condition
V. Subramaniam and K. Palanisamy

Two varieties of sorghum viz., CSH. 5 and Co. 18 with two levels of fertilization viz., blanket recommendation (90:60:40 kg of NPK/ha) and soil test recommendation (50:30:30 kg of NPK/ha) were tested under rainfed conditions. Sorghum CSH. 5 and Co. 18 yielded 1623 and 1293 kg per hectare respectively and yields between varieties were not significant. The blanket recommendation (90:60:40 kg of NPK/ha) and soil test recommendation (50:30:30 kg of NPK/ha) gave mean yields of 1631 and 1286 kg /ha respectively and were not significant.

R. 8. Agron. 203 Evaluation of suitable cropping pattern for the rainfed area
V. Subramaniam and K. Palanisamy

The experiments with four crops rotation revealed that groundnut *samai* or groundnut-*ragi* can be recommended as suitable double crop sequence in the dryland tracts of Dharmapuri District.

R. 8. Agron. 204 Fertilizer response study in rainfed groundnut variety
V. Subramaniam and K. Palanisamy

Fertilizer response study under rainfed condition with three varieties and two levels of fertilizers showed that the fertilizer application did not increase the yie'd significantly. Among three varieties tried POL. 2 was found to be the best yielder and could be recommended for this region for large scale cultivation.

R. 8. Agron. 205 Evolving package of practices for maximization of rice prouduction in Krishnagiri Reservoir Project area.
V. Subramaniam and K. Palanisamy

The results indicated parity between methods of irrigation practice and between fertilizer levels. Treatment with *Azotobacter* showed no significant improvement in the yield of rice varieties. The yield performance of varieties was however, highly significant. The mean yields of *Vaigai* and *Kannagi* were 2352 kg and 1922 kg of grain/ha respectively. Strain Vaigai is recommended for the tract for cultivation as a suitable short duration variety.

R. 8. Agron. 208 Time of sowing trial in cotton
N. S. Loganathan and R. Nagarajan

Eight successive sowings starting from 16-5-75 at 15 day intervals were taken up using MCU. 5 and MCU 6 under rainfed condition. MCU. 5 and MCU. 6 sown in May 16th recorded the maximum yield of 375 kg/ha and 820 kg/ha respectively.

R. 9. Agron. 204 Package of practices-rice
V. Subbiah, U. Selvaraj, S. Ramakrishnan, N. Jaleel Ahmed and K. C. Chandy

A trial with *Vaiagi* and *Kannagi* as test varieties to study the effect of sheep foot roller working verses no sheep foot roller treatment and adopting all the recommended package of practices besides the *Azotobacter* treatment and fertilizer schedule as per soil test recommendation and blanket recommendation was laid out in the *Kuruvai* 1975 season. From the grain yield data it was seen that significant differences were there only for the variety and the sheep foot roller treatments while the data were not significant in respect of other factors studied. Between the varieties Kannagi was significantly superior to Vaigai, the yields recorded being 5337 kg/ha and 5037 kg/ha respectively.

R. 9. *Agron.* 212 **Effect of *Azotobacter* on rice under Aduthurai soil conditions**

V. Subbiah, U. Selvaraj, S. Ramakrishnan and staff of Biology Department, Tamil Nadu Agricultural University Coimbatore

A trial adopting split plot design and Co. 39 as the test variety was laid out in *Kuruvai*, 1975. The *Azotobacter* treatment as the main plot factor and five different nitrogen levels (N_1-50.00 N_2-42. 75, N_3-37.50, N_4-31 25 and N_5-25.00 kg N/ha) as sub plot treatments. The yield differences were found to be significant only in respect of nitrogen levels and not so either with *Azotobacter* or interaction. It was seen that yield of treatment N_1 was significantly superior to N_3 and N_5 though it was on par with N_4 and N_2 and yield obtained in different nitrogen level treatments are 3507, 3287, 2982, 3324 and 2866 kg/ha for N_1, N_2, N_3, N_4 + N_5 respectively. The results revealed that there was no particular advantage due to *Azotobacter* under Aduthurai soil conditions.

R. 10. *Agron.* 201 Spacing cum manurial experiment

T. K. Ramachandran, K. Balasubramanian and
N. R. Chandrasekaran

Response to manuring by coconut palm is very well expressed in its yield. An application of ($N_2P_2K_2$) 680 g, of N, 454 g. of P and 907 g of K has recorded the highest yield of 55 nuts per palm per year, the increase in yield being 70.3 per cent followed by N_1 P_1 K_1 (340 g N+227 g P+454g K) with 45 nuts (39.5 percent increase) over no manure.) N_0 P_0 K_0 recorded the least i.e., 32.3 nuts.

with regard to spacing, production of nuts based on calculated poulation in unit area. (ha.) revealed that palm planted at a spacing of 6.1 m x 6.1 m has registered an increase of 940 and 1905 nuts respectively over the palms planted at a spacing of 7.6 m x 7.6 m and 9.1 m x 9.1 m though the yield per palm under the 9.1 m x 9. 1 m is highest.

R. 10. *Agron.* 209 Study of effect of summer irrigation on coconut

K. Balasubramanian, C. Jayaraman and
N. R. Chandrasekaran

Hundred palms of uniform age were taken for studying the effect of summer irrigations on the yield of nuts. Irrigations were given at an interval of 10 days. A study of the yield data for the past four years revealed that irrigated palms have recorded a mean yield of 96 nuts per year as against 34 nuts of unirrigated palms, the increase in yield being 182.4 per cent over the unirrigated ones.

R. 13. Agron. 205. Effect of chemical ripeners in difficult to ripen conditions
K. V. Daniel and M. Suresh Kumar

Three chemical ripeners, viz., Cycocel, Polaris and Sodium meta silicate were sprayed at 9th month, i.e., one month prior to first harvest of sugarcane. Among the ripeners, Cycocel recorded maximum C.C.S % of 11.50, followed by Polaris and Sodium meta silicate with 11.30 and 11.23 respectively.

R. 15. Agron. 202 Plant population cum fertiliser dosage for groundnut
N. Gopalaswamy and R. Elangovan

A spacing cum manurial trial on semi-spreading variety (TMV. 10; was laid out with five spacing (20 X 15 cm ; 30 X 15 cm ; 30 X 20 cm) 30 X 25 cm ; 30 x 30 cm ;) and twelve levels of fertilisers (combination of two levels of N and P (0, 10 kg/ha); and three levels of K (0, 45, 90 kg/ha). The treatment with a spacing of 30 X 20 cm recorded significantly higher yield (910 kg/ha.) by 14.2 per cent over the widest spacing of 30 x 30 cm (797 kg/ha). The adoption of this spacing of 30 X 20 cm resulted in a net profit of Rs. 193/ha over the widest spacing.

In another trial conducted to evaluate the impact of the adoption of package of practices such as seed treatment with Thiram, recommended spacing, manuring, chemical weed control and plant protection, on the yield of rainfed groundnut (var. TMV. 9), the results indicated that the adoption of seed treatment (with Thiram), a spacing of 30 x 8 cm, pre-emergence application of Tok-E-25 at 2 kg a.i/ha and spraying (plant protection) thrice on 20th, 40th and 60th day after sowing registered a net profit of Rs. 593. 28/ha over the ryots' method (5 tonnes of FYM/ha and spacing of 15x15 cm' manual method of hoeing and weeding, adopting plant protection measures as and when necessary).

R. 15. Agron. 205 Control of weeds in groundnut by herbicides
N. Gopalaswamy and R. Elangovan

In a trial conducted to fix an economical method of weed control for rainfed groundnut crop (var. TMV. 9), combining the pre-emergence application of Nitrofen at 1 Kg or 2 kg a.i/ha alone followed with conventional method of hoeing and weeding at 20th or 40th day after sowing, application of Nitrofen (Tok-E-25) at 1 Kg a.i/ha followed by one conventional manurial hoeing and weeding on 20th day after sowing was found to be economical (1162 kg/ha). The treatment registered a net monetary return of Rs. 603.80 over the treatment Nitrofen applied at 2 kg a.i/ha without any subsequent hoeing and weedings (947 kg/ha). At the same level of concentration (ToK E. 25 at 1 kg a.i/ha) when the hoeing and weeding was delayed to 40th day there was a reduction in yield by 113 kg/ha resulting in a monetary loss of Rs. 400.60/ha.

R. 17. Agron. 206 Mulching Experiment

C. T. Natarajan and Amirtham Anthony Dasan

A mulching experiment was laid out during 1975 *Rabi* season with sorghum Kovilpatti tall using three mulching materials viz., *bajra* straw, sorghum stubbles and paddy straw along with dust mulch and control (no mulch). Sorghum stubble mulch recorded the highest mean grain yield of 872 kg/ha with an increase of 78.5 per cent over no mulch.

R. 17. Agron. 209 Critical periods of crop weed competition on sorghum

C. T. Natarajan and Amiratham Anthony Dasan

During *Rabi* 1975 the experiment was laid out with two sets of treatments viz., (1) weed free environment for 7, 14, 21, 28, 35, 42, 49 days and till maturity and (2) weed infested environment for 7, 14, 21, 28, 35, 42, 49 days and till maturity. The grain yield data showed that keeping the sorghum field free of weeds from two weeks after germination till five weeks was sufficient to get the maximum yield. Weed free environment for the first 35 days gave 587 kg/ha of grain yield while weed infested condition upto 14 days gave 488 kg/ha.

R. 17. Agron. 219 Study on the efficiency of application of various frequencies of organic matter on rainfed cotton

P. Pothiraj

The efficiency of application of farm yard manure at 10 t/ha (i) every year, (ii) in alternate year and (iii) once in three years was compared against no manuring. Application of farm yard manure every year at 10 t/ha recorded the highest yield of 747 kg of kapas/ha with 16 per cent increase over no manuring which recorded 642 kg/ha. Application of farm yard manure every year gave a net profit of Rs. 242/ha.

R. 18 Agron. 206 Study of the efficacy of *Azotobacter* in cotton production

S. R. Chowdappan

In the experiment conducted on different graded levels of nitrogen and *Azotobacter* treatments, the differences in kapas yield due to the interaction of nitrogen levels with *Azotobacter* alone were significant.

Application of 75 per cent nitrogen in soil and seed treatment with *Azotobacter* recorded 1336 kg of kapas/ha with 25 per cent saving of nitrogen and a net profit of Rs. 966/ha. The normal application of nitrogen 100 per cent through soil recorded 1020 kg of kapas/ha.

R. 19. Agron. 201 Studies on the optimum cropping patterns for Pondicherry region

E. Subbiah

In the rice based farming systems the crop rotation of rice (*Bhavani*) planted in October '74' groundnut (TVM 7) sown in February '75 and rice

(*Amaravathy)* planted in June '75, gave 13.5 t/ha with 39 kg of grain yield per day. This was followed by the rotation of rice (*Bhavani*),-rice (*Amaravathi*), - rice (Amaravathi) planted in the respective seasons yielding 12.4 t/ha with per day yield of 38 Kg of grain. The above said two rotations in the rice farming conditions of Pondicherry were better than rice-rice-groundnut, rice-*ragi*-rice and rice-*ragi*-groundnut. Rice series gave a maximum net income as estimated on per day basis while rice-groundnut-rice series gave maximum net income per year.

R. 19. Agron. 203 Studies on the individual and combination of different weedicides in rice
E. Subbiah

It was observed that the two combinations of pre-emergence + post emergence soil application of herbicides (pre-emergence application of machete granules at 1 kg a.i/ha + post-emergence application of Stam F. 34 at 1.75 kg a.i/ha, pre-emergence application of weedone granules at 0.4 Kg a.i/ha + post-emergence application of Stam F. 34 at 1.75 kg a.i/ha) were highly effective for weed control with 64.2 and 65.6 per cent weed control efficiency respectively. The grain yields obtained were 4261, 3901 and 3229 Kg/ha respectively for the above said first, second combinations and control. Application of Stam F 34 alone as post-emergence at 3.5 kg a.i/ha has recorded the maximum crop injury (5 per cent). The minimum crop injury was observed with the combination of pre-emergence machete granules application at 1 Kg a.i/ha + post-emergence application of Stam F 34 at 1.75 kg a.i/ha.

R. 19. Agron. 204 Studies on the individual and combination of different weedicides in *ragi*
E. Subbiah

A weedicide trial conducted in Summer 1975 on Co 10 *ragi* showed that the two combinations of pre emergence application of herbicides (pre-emergence application of weedone concentrate at 1.5 lit/ha + pre-emergence application of Tok E. 25 at 3.5 lit/ha; pre emergence application of Fernoxone at 0.75 kg/ha) were effective for weed control with 80 and 82 per cent weed control efficiency respectively. The grain yields obtained were 1899, 2056 and 1663 kg/ha respectively for the above said two combinations and control. The grain yields obtained in the hand weeded plot was 1823 kg/ha. None of the weedicide treatment showed more than 1 per cent crop injury.

Economics of treatments are as follows:-

I. Combination		II. Combination	
1.5 1t. of weedone concentrate	30.00	1.5 lit of Gramaxone	60.00
3.5 lit Tok E. 25	70.00	0.75 kg of Fernoxone	15.00
	100.00		75.00

Expenditure on hand weeding was Rs. 240/- ha and there was a saving of Rs. 140/- ha in in the first and Rs. 165/- ha in the second weedicide combination, if the cost of saving in labour and additional grain yields are accounted for.

3. SOIL SCIENCE AND AGRICULTURAL CHEMISTRY

R. I. SS & AC. 202 Evaluation of rooting pattern of some important field crops using radioisotopes
T. L. Subramaniam and K. Kumaraswamy

An experiment conducted to study the distribution pattern of roots by using tracer technique with three rice varieties viz., Bhavani, CO 36; and IR. 20 has shown that about 75% of the roots of the above rice varieties were concentrated in the zone of 10 cm horizontal distance and 16 cm depth. Most of the P taken by the plant was concentrated in the grain.

R. I. SS & AC. 202 The influence of rhizosphere on the physico-chemical properties of soils
V. Ravikumar and T. M. Thiagarajan

The physical properties of rhizosphere soils at harvest with sorghum (COH 2). blackgram (Co. 1) and cotton (MCU. 5) rotation showed improvement in physical properties like hydraulic conductivity, stability index and aggregate stability, while pH and EC of soils did not show any appreciable variation when compared with fallow treatment. Bacterial population was high in the root concentration zone. *Actinomycetes* population was higher in the cropped series than fallow in all the three depths studied viz., 0–15, 15–30 and 30-45 cm.

R. I. SS & AC. 205 Studies on fixation of plant nutrients
K. M. Ramanathan, S. Subbiah and Honora J. Francis

The results of a field experiment conducted with Co.7 *ragi* as test crop has shown that there was a considerable increase in the available N status of the soil at post-harvest stage as compared to the pre-sowing status. There was no change in the available P status of the soils throughout the period of crop growth, while there was a considerable decrease in the available K level, indicating depletion of the exchangeable K due to crop removal or fixation.

R. I. SS & AC. 211 Extraction and production of leaf protein from different plant species
C. S. Balasundaram and S. Loganathan

A study to find out the effect of manurial treatments and cuttings on the dry matter and extractable protein yields with four fodder grasses viz., *Panicum maximum, Brachiaria mutica; Cenchrus glaucus* and *Cenchrus ciliaris* revealed that *C. glaucus* was found to be superior in the dry matter and extractable protein. Among the treatments tried FYM at 25 t/ha+

ammonium sulphate at 30 kg/ha was found to be better. With regard to extractable protein, second cutting was better for *Panicum maximum* and *Brachiaria mutica*, while third and first cutting were superior for *C. glaucus* and *C. ciliaris* respectively.

R. I. SS & AC. 214 Influence of high fertilization on the quality of crop produce

G. V. Kothandaraman and R. Krishnaswami

A field experiment conducted with the object of studying the influence of N fertilization on the quality of *ragi* grain showed that the crude protein content of *ragi* grain was significantly increased by the application of N upto 120 kg/ha in all the three varieties viz., CO.7, CO.10, Saradha and in the culture 4849.

The results of a field experiment conducted on the quality of sorghum grain showed that the crude protein content of sorghum grain was increased from 11.26 to 13.24% and 10.93 to 13.70% respectively by the application of N at 80 kg/ha in the two varieties viz., CSH. 1 and Kovilpatti tall.

R. I. SS & AC. 221 All India Coordinated Scheme on Micronutrients

C. K. Rajagopal, M. Moosa Sheriff, R. Devarajan and R. Nagarajan

Analytical work carried out on the 421 soil samples collected from Madurai district revealed that 69 per cent of the soils are deficient in zinc and requires zinc fertilization. An application of zinc sulphate at 10—20 kg/ha is recommended for cereal crops in Zn deficient areas of Madurai district.

R. I. SS & AC. 222 All India Coordinated Scheme for improvement of soil physical conditions to increase agricultural production of problamatic areas

V. Ravikumar, K. Shanmugam, T. M. Thiagarajan and S. Subrammanian

Application of organic wastes like pig manure, poultry manure and farm yard manure at 10 t/ha increased the mean yield of black gram PLS. 364 by 41, 24 and 26 per cent respectively. Physical properties of soils like porosity and hydraulic conductivity also showed improvement by their application.

In red sandy loam soils cowpea Co. 1 and Deccan maize were found to tolerate a bulk density of 1.7 gm/cm^3 beyond which the growth and yield were adversely affected. The mobility of nitrogen and potassium were reduced with increase in bulk densities from 1.5 to 1.9 gm/cm^3.

Bench mark profile studies conducted in the soils of Perianaickenpalayam and Peelamedu series of Coimbatore district showed structural problems like poor hydraulic conductivity.

R. I. SS & AC. 224 All India Coordinated Project for Research on forage crops
P. Muthuswamy and M. Govindaswamy

In the varietal cum manurial trial on fodder maize, it was observed that Ganga-5 recorded the maximum crude protein content (9.9 per cent) followed by F_2 generation of Ganga-5 (9.56 per cent) Deccan hybrid (9.43 per cent), and local variety (8.47 per cent). Application of N and P at 80 and 60 kg/ha respectively had significantly increased the crude protein content of the fodder maize.

In the study on the cutting interval of lucerne, a significantly higher crude protein (24.3 per cent) was recorded in the cutting taken at the fourth month from sowing followed by the third month cutting. Maximum P was registered in the cuttings taken at sixth and seventh month (0.25 per cent). However the varieties did not differ significantly in their crude protein and P content. The calcium content was significanlty higher at fifth month (2.67 per cent) cutting. The dry matter content increased with the age of the crop.

In study on the fodder value of CSH-5 sorghum. the highest HCN (650 ppm) was registered on eighteenth day and it decreased to less than 75 ppm after fourtieth day. The crude protein content was maximum at twenty third day and it decreased with the age of the crop.

R. I. SS & AC. 225 Chemical studies on All India Coordinated Agronomic Experiments Project
M. Guruswamy, G. Viswanathan V. Durairaj Muthiah and V. Sarkunan

The uptake pattern of N and P by different varieties of rice at varying levels of N and P over a constant basal dreesing of K was studied at Thanjavur and Kariyiruppu centres.

Among the varieties ADT 29, Co 33, Cul. 8946, IET 1722 and IET 2508 tested at Thanjavur, the N uptake in grains ranged from 65.03 to 89.74 kg/ha, the variety ADT.29 recording the maximum uptake of N in grain at 60 kg N/ha, while IET. 2508 recorded the maximum uptake of N at 120 kg N/ha. ASD.1 variety recorded the maximum uptake of N (89.91 kg/ha) among the varieties viz., ASD 1, kannaki and cultures No.2, 46, 8946 at Karaiyiruppu centre.

The variety IET 2508 recorded the maximum uptake of P (18.14 kg/ha) followed by ADT. 29 at Thanjavur, while the P uptake was maximum in ASD-1 variety followed by cul. 8946 at Karaiyiruppu centre.

The uptake pattern of N and P by different varieties of sorghum was studied at Bhavanisagar centre. The uptake of N by the different sorghum varieties viz., Co.18, CSH.1, CSH.5, CSV.3 and CSV. 4 increased with increa–

sing levels of N. The variety CSH.5 recorded the maximum uptake followed by Co 18 and CSH 1. The P uptake was maximum in the variety Co 18.

R. I. SS & AC. 227 Studies on the nutrient ratios (NPK) for high fertility strains of paddy with special reference to phosphorus nutrition using tracer technique
V. S. Krishnamurthy and S. Ramanathan

Field experiment conducted employing Vaigai and Co 38 as test crops with thirty six different combinations of NPK showed that Vigai possess a comparatively high N requirement than Co 38 Co 38 recorded higher yield than Vaigai in the overall performance. Responses to P and K were not marked. NPK ratios of 90:45:90 for Co 38 (8119 kg/ha) and 270:45:90 for Vaigai (8648 kg/ha) were associated with maximum yields among the 36 ratios. The straw yields were more than double in Co 38 as compared to Vaigai.

R. I. SS & AC. 228 All India Coordinated Scheme for investigation on correlation of soil test with crop response
C. S. Balasundaram, M. Shanmugam, H. Hameed Khan, R. Chandramani and T. Balaguru

Field experiments were conducted at ten different locations covering three major soils groups with six high yielding varieties of rice to study the response behaviour to the application of nitrogen. Ammonical nitrogen which behaves as immobile nutrient under water logged conditions of low land rice soils has obeyed Mitscherlich-Bray equation.

The close relationship observed between the actual yield and calculated yield shows the validity of the approach. The study provides a site specific fertiliser recommendation for a given soil test value and also offers scope for the farmer to choose the fertiliser dose for a trargetted yield in cognisance with the monetary aspect. For a given soil test value of 200 kg/ha of available N by alkaline permanganate method for obtaining yields at 75, 88 and 96 per cent the recommended dose of nitrogen for clay loam soils are 82, 155 and 263 kg/ha, while it is 130, 221 and 358 kg/ha for sandy loam soils.

R. I. SS & AC. 232 Effect of intensive cultivation of high yielding crop varieties on soil properties
K. K. Krishnamoorthy and S. Vadivelu

The results of post-harvest soil samples of fifth and sixth crop of rice IR 20 grown continuously in the same field has shown that the available N content of the soil did not vary with the levels of N applied. The available P status of the soils was increased by the continuous application of P fertiliser. The results of analysis of fourth and fifth crops of rice has shown that the N content of the grain increased with increasing the levels

of N and the protein content of the grain was increased from 7.50 to 10.00 per cent by the application of N at 540 kg/ha.

R. I. SS & AC. 235 Soil test crop response studies with high yielding varieties.
C. S. Balasundaram

A nitrogen gradient field experiment at Coimbatore with seven levels of nitrogen 0, 50, 100, 150, 200, 250 and 300 kg/ha on rice, variety Vaigai have shown that a maximum yield of grain 5333 kg/ha was obtained by the application of N at 250 kg/ha. The increase in yield for 250 kg N/ha over control (1871 kg/ha) was 185 per cent. The additional income for 250 N kg/ha over control was Rs. 3943 ha. Beyond the level of 250 kg N/ha there was a reduction in the yield of grain. The optimum dose was found to be 216.74 kg N/ha.

R. I. SS & AC. 242 Permanent Manurial Experiments
K. K. Mathan, K. Sankaran and N. Kanakabushani

The results of field experiments conducted with K 8 cotton and Co 4 *tenai* under rainfed condition (OPM) revealed that maximum yields was obtained in cattle manure treated plot followed by NPK plot.

The results of field experiments conducted with MCU 5 cotton, Co. 7 *ragi* and Ganga 5 maize under irrigated condition (NPM) indicated that NPK plots were superior in yield in all the three crops followed by N P and cattle manure plots.

R. I, SS & AC. 244 Studies on the carbohydrate content of tapioca, sweet potato and potato under varying agronomic practices.
P. Muthuswamy

In the variety cum manurial trial on tapioca the HCN content of the tuber and rind was estimated at monthly intervals from seventh month onwards till the harvest of the crop. In the tuber, maximum HCN content was recorded in the seventh month and it decreased gradually and the lowest HCN was recorded at the time of harvest. Almost in all the periods of analysis the varieties differed significantly in their HCN content, the highest being recorded in H 165 followed by Coimbatore local and Burma. In the rind, the highest amount of HCN was recorded in the eighth month and it decreased towards maturity. Coimbatore local type was found to have higher HCN content in the rind followed by H 165 and Burma types.

R. I. SS & *AC*. 245 Studies on the screening of different plant species like prosophis, grasses, straw, sunflower, *mesta*, cotton etc. for cellulose content and other characters with reference to their suitability for paper making.

U. S. Sree Ramulu and K. Rajendran

A screening of various plant species for their cellulose content with special reference to paper making has shown that the Cumbu Napier hybrid, NB -21 grass had a high yield potential and this could be recommended to be used along with other cellulose producing materials like *Eucalyptus* hybrid and bamboo for paper making.

R. I. SS & *AC*. 247 Studies on the mineralisation of slow acting fertiliser and the effect of nitrification inhibitors on their transformations in the soil

T. S. Manickam and D. Augastine Selvaseelan

The experiments conducted with different nitrification inhibitors and fertiliser in different soils have shown that the slow acting fertiliser CDU (Grotonylidine diurea) is very efficient in regulating the mineralisation and releasing the nitrate nitrogen, following by neem seed crush mixed ammonium sulphate (24.1 per cent inhibition of nitrification) and lac coated urea (19 per cent inhibition of nitrification). In sandy loam soil, N-serve inhibits nitrification up to 31.8 per cent.

R. I. SS & *AC*. 251 Studies on the extraction of rice bran oil from different varieties of paddy

U. S. Sree Ramulu and K. Rajendran

Out of the 40 varieties of paddy tried, the following varieties were found to yield high amounts of bran oil the percentage (given in brackets) as well as total yield per hectare, Vaigai (16.1 %), Co 34 (18.5 %), Co 35 (16.2 %) Cul 658 (16.8 %), Co 33 (18.9 %) Co 36 (17.1 %) IR 24 (16.6 %) and IR 20 (14.8 %) in contrast to the following which gave poor percentage as well as yield: IET 2223 (11.9 %), PVR (10.9 %) Co 39 (11.8 %) IR 26 (12.4 %) GEB 24 (11.0 %).

R. 1. *SS* & *AC*. 253 Effect of soil amendments on the physical properties of soil

V. Ravikumar

Application of mineral wastes like magnesite and algime at 5 t/ha applied seperately on the acidic laterite soils of Yercaud (Salem district) significantly increased the yield of potato (Great Scot) by 38 per cent over control individually. The hydraulic conductivity of the soils on the above treatments also showed improvement.

R. I. SS & AC **255** **Studies on the methods of nitrogen fixation in soils by the addition of organic matter and phospherous**
P. P. Ramaswami and K. Andi

Rice IR 20 was tested as a test crop to study the response due to straw + P addition in the place of NPK application. Application of straw at 10 t/ha with P at 90 kg/ha was found to give yield of rice on par with NPK at 180: 90: 90 kg/ha respectively. There was no significant difference in yield of rice grain IR 20 between these two methods.

R. 2. SS & AC 201 Studies on soil test crop response for high yielding varieties of rice
C. R. Venkataraman and S. Mani

The analysis of soil samples and plant material samples collected during the different stages of the growth of rice varieties IR 20 and Bhavani have revealed that the uptake of the major nutrients was significantly higher in the higher levels of fertilization when compared to the soil test dose of fertilization without any corresponding increase in the yield of grain.

R. 2. SS & AC 202 Study of storage life and keeping quality of pesticides in common use.
A. Gopalswamy and A. Chandrasekaran

After a storage period of fifteen months, there was a reduction to an extent of 7.8 per cent in BHC and 13.4 per cent in DDT in their active ingredient contents. Only marginal or very little deterioration due to storage was found in the case of other chemicals like Endrin, Kelthane, Carbaryl, Formothion and Phosphomidon.

Biological easay conducted on groundnut red hairy caterpillar using stored and fresh chemicals showed significant differences among pesticides between stored and fresh samples and among periods of observation in the case of larvae.

R. 2. SS & AC 206 Study on the methods of reclamation of saline alkaline soils
A. Gopalswamy and T. Balakrishnan

The statistical analysis of yield of IR 20 paddy showed that the treatment 6.5 tonnes of gypsum plus 37.5 kg Zn SO_4 per hectare gave maximum yield of both grain and straw. Among the organic amendments, press mud at 25 tonnes per hectare gave maximum yield.

R. 2. *SS* & *AC* 208 Compatibility of pesticides and fertilizer mixtures
C. N. Venkataraman and V. Narasimhan

Compatability studies of herbicides Machete and Stam F. 34 with straight fertilizers like urea, superphosphate and muriate of potash and with mixed fertiliser (standard mixture No 2) have revealed that there was no deterioration either in active ingredients of the herbicides and the nutrients in the fertilizers.

R. 2. SS & AC 209 Effect of high doses of NPK on the availability of micro-nutrients
K. Govindaraj and A. Chandrasekaran

Among foliar and soil application of micro-nutrients, foliar application of Zinc at 25 kg $ZnSO_4$/ha and soil application of manganese at the rate of 25 kg $MnSO_4$/ha gave the maximum yield of rice Bhavani when the NPK level was twice as that of soil test recommendation.

R. 2. SS & AC 210 Determination of physical, chemical and mechanical properties of soil types in the Periyar Command Area and assesment of long term effect on them
C. N. Venkataraman, S. Sukumaran and V. Narasimhan

Profile soil samples collected from Mangulam, Alanganallur, Kulamangalam, Paravai and Valandur were analysed for their chemical and physical properties. The soils were found to be sandy loam to sandy clay loam in all the places except Valandur where the soil was clayey. As regards nutrient status all the soils were low in nitrogen and phosphorous but high in potash. The analysis of channel and well waters in the above areas indicated their suitability for irrigation except the well water at Valandur which is not suitable for continued irrigation.

R. 2. SS & AC 211 Permanent Manurial Experiment on rice
C.R. Venkataraman, G. Ramanathan and S. Mani

A permanent manurial experiment on rice was started in July 1975 to determine the effect continuous application of fertilisers alone in combination with organics on soil properties, uptake of nutrients and quality of crop. The design is split plot with 4 treatmants (organics) in the main plots and 8 treatments (fertilizers) in the sub-plots and with two replications.

The yield data from the first crop, variety Bhavani, indicated that the main plot treatments were not significant. The sub-plot treatments were significant revealing that the treatments receiving N either alone or in combination with P and K were significantly superior to the rest of the treatments without N in so far as the grain and straw yields were concerned. The interaction between organics and in-organics was not significant.

R. 15. SS & AC 202 Detailed analysis of kernals of groundnut varieties for quality appraisal
C. R. Lakshminarasimhan and R. Surendran

During the *kharif* 1975 trial on molybdenum as foliar spray at graded doses of 0, 90, 180.270, 360, 540 and 720 ppm/ha, the variety *Ah* 8254 showed

significant response at 180 ppm/ha level wirh respect to yield (654 kg/ha, 16.6 per cent over control). Ammonium molybdate was used in this trial. The nodule counts taken at 60th day were non-significant.

R. 17. SS & *AC* 202 Study of the effect of mulching on soil moisture
N. M. Thyagarajan and K. Subbiah

The effect of various mulches on soil moisture content was studied. Soil samples were drawn at 0-30 cm depth at sowing and thereafter at physiological stages of the crop (Cotton) and present moisture determined gravimetrically. Straw mulch stored maximum moisture followed by groundnut shell mulch, the percent moisture was 22.61 and 22.29 respectively. Stubble mulch, straw mulch, sawdust mulch and groundnut shell mulch were all on par but superior to weed mulch.

4. AGRICULTURAL ENTOMOLOGY

R.1. Ag. Ent. 201 Studies on the white-tip nematode of rice
T. S. Muthukrishnan, V. V. Ramamoorthy and G. Rajendran

Field observations carried out on Bhavani have shown that hot water treatment of seeds + Parathion 0.025 per cent spray on 45th day after transplanting and Fenthion 0.1 per cent spray twice on 30th and 45th day after transplanting significantly reduced the loss in grain weight and increased the yield by 50 and 53 per cent respectively. Steeping the seeds for 48 hours in water solutions of pesticides caused mortality of the nematode 50.17 to 76.05 per cent in lannate, Aldicarb and Carbofuran W. P. at 0.1 per cent concentration, 56.92 to 64.50 per cent in Phorate, Aldicarb, Carbofuran, Fensulphothion granules at 1 kg a. i. per 100 kg of seeds and 47.5 per cent to 51.9 per cent in Parathion, Metasystox, Fenthion, Fenitrothion and Orthobux E. C. at 0.1 per cent concentrations.

R.1. Ag. Ent. 202 Studies on the rice root nematode
T. S. Muthukrishnan, G. Rajendran and V. V. Ramamoorthy

In the field experiments on the control of the nematode, it was observed that Carbofuran root dip at 0.1 per cent Phorate 10 per cent G and Carbofuran 3 per cent G at 1 kg a. i./ha controlled the nematode effectively and increased the yield by 62, 45, 32 per cent respectively.

R.1. Ag. Ent. 208 Control of groundnut surulpuchi
P. M. Srinivasan and S. Sadakathulla

At Aliyarnagar two rounds of sprays of Dursban 0.05 per cent, Nuvan 0.1 per cent, Phosalone 0.05 per cent, Phendal 0.05 per cent and two rounds of dusting with Dipterex 5 per cent, were on par and superior to control in reducing the incidence.

R.1. Ag. Ent. 210 Control of pod borer in Red gram
P. P. Vasudeva Menon and R. Jebamoni Rabindra

Application of Aldicarb 10 per cent granules on the 45th day of sowing at 1.25 kg a.i./ha has registered maximum yield (1441 kg/ha) by controlling the pod borers in red gram which was followed by spraying of Chlorphenavindine 0.1 per cent at 1000 litres of spray fluid/ha (1363 kg/ha), Trichlorphon 5 per cent dust (1269 kg/ha) and Endosulfan 4 per cent dust (1171 kg/ha) each at the rate of 1.0 kg a.i./ha and the yield was 806 kg/ha in control. The dusts and sprays were applied twice at fifteen days interval, the first round commencing at flowering and the second at early pod formation stage. All the treatments tried were found to be superior to untreated control in reducing the pod borer damage. However, Endosulfan 4 per cent dust has recorded less damage by pod borer (2.5 per cent incidence) against control (11.6 per cent incidence).

R.1. Ag. Ent. 212 Control of major pests of Bhendi
P. P. Vasudeva Menon and S. Uthamaswamy

Application of Aldicarb (Temik) at 1 kg a.i./ha 15 days after sowing reduced the incidence of major pests compared to the other insecticides of Disulfoton 5 G (Solvirex), Mephosfolan 5 G (Cytrolane) and Carbofuran 3 G (Furadan) at 0.5 and 1 kg a.i./ha in Co. 1 Bhendi. Fruit borer incidence was found to vary from 22.87 to 28.65 per cent in Temik.

R.1. Ag. Ent. 214 Control of major pests of gourds
P. P. Vasudeva Menon and T. Surulivelu

To control the fruitfly damage on bittergourd, various spray formulations of insecticides were tried. The results of the experiment indicate that three sprayings with Acephate (Orthene 75 W. P.) 0.1 per cent or Chlorfenvinphos 0.05 per cent (Birlane 24 EC) at an interval of 15 days, commencing from flowering reduces the fruitfly incidence. The percentage of incidence was 12.99 and 23.04 in treated (Birlane) and untreated plots respectively.

R.1. Ag. Ent. 215 Studies on the nematode parasites of chillies
T. S. Muthukrishnan and G. Rajendran

In the screening of CA(P) varieties for resistance to the root knot nematode, *Meloidogyne arenaria*, four varieties-CA(P) 86, CA(P) 189, CA(P) 165 and CA(P) 176 showed root galling ranging from 0.75 to 2 per cent as against 40.5 per cent observed in one of the varieties CA(P) 146. Pot culture studies carried out with different chemicals for the control of root knot nematode have shown that application of Nemacur 5 per cent G and Aldicarb 10 per cent G at the time of planting were effective in reducing the root galling.

R.1. Ag. Ent. 217 **Control of stem borer, leaf roller and leaf hopper on rice**
I. P. Janaki and R. Velusamy

Three trials were taken up during *Rabi* 1975 one with granular formulations and the other two with spray formulations on variety Bhavani. Two rounds of application of Chlorfenvinphos 10G, Furadan 3G, Fensulfothion 5G and Quinolphos 5G and Paddigard at 3 dosages 0.75, 0.50 and 0.25 kg a.i./ha at 12 and 60 DAT were compared with maximum protection (Furadan SD+Birlane G at 1 kg a.i./ha, 20, 40 and 60 DAT) and the local method (Furadan SD+Fenthion spray 30, 45 and 60 DAT). The local method was found to be superior in reducing the pest incidence and increasing the yield by 30 per cent over control. The cost of treatment worked out to Rs. 340/ha and gave a net profit of Rs. 1651/ha. All the chemicals tried were found to be effective in reducing the white ear incidence and were on par except Fensulfothion.

In another trial, Ambithion 50 E. C. Chlorfenvinfos 24 EC, Phosphamidon 100 EC, Chlorpyrifos 48 EC, Quinolphos 25 EC, Fenitrothion 100 EC, Mipcin 20 EC and Leptophos 35 EC were sprayed at 20 and 60 DAT and compared with maximum protection (Furadan SD + Chlorfenvinphos 1 kg a.i./ha, 20, 40 and 60 DAT + parathion spray.) Statistical analysis indicated that the maximum protection treatment was the best in reducing the white ear incidence and increasing the yield by 42 per cent over control. All the spray formulation were on par. The comparative cost benefit ratio of the chemicals could not be worked since the cost of the chemicals were not known. Three chemical control trials were conducted during *Kharif* 1975 on rice variety Bhavani. Chlordimeform at 0.5 and 1 kg a.i/ha applied on 12, 55, 60 DAT controlled the stem borer, plant hopper and the leaf roller. The treatments gave 4291 kg/ha and 4132 kg/ha at 0.5 and 1.0 kg a.i./ha respectively while the yield was 1815 kg/ha in control. In the other two *kharif* trials also, chlordimeform at 0.5 kg a.i/ha applied 15, 53, and 70 DAT or 1 kg a.i. at 50, 60, 70 and 77 DAT was found to be effective in controlling the stem borer, the plant hopper, the leaf roller and the brown leaf hopper.

R.1. Ag. Ent. 218 Screening for resistance to stemborer, leaf hopper and leaf, roller in paddy
I. P. Janaki and R. Velusamy

One hundred and five (short duration) varieties in germplasm were screened for stem borer incidence. Only 9 types recorded above 3 per cent white ear damage. Out of 1349 varieties observed in the National Breeding Nursery trial (protected conditions) 167 were found to be free from stem borer damage at the heading stage, 734 recorded 1.3 per cent and 448 above 3 per cent which is considered rating for susceptibility. Themaximum percentage noted was 21.2 per cent in IET 4287. Cauvery, Sona and Jaya were susceptible. Twenty six varieties (IRYN) raised at Bhavanisagar

under protected conditions were all found to be susceptible to stem borer, the white ear incidence ranging from 12.28 to 32.76 per cent. During *Kharif* 1975, 983 types (long and medium duration) in the germplasm and 843 numbers in the F_3 and F_4 generations were raised under unprotected conditions.

Germplasm: Brown plant hopper incidence was noted for the first time and 93 numbers were found to exhibit hopper burn symptoms indicating their susceptibility. Stemborer damage at the heading stage indicated 541 varieties recording less than 3% white ear incidence out of which 53 were susceptible to brown plant hopper and 424 numbers above 3% out of which 40 were susceptible to the hopper. The varieties recording less than 3% will be tested against next *kharif*. Six numbers viz. CR 44-118-1 (IET 4151) CR 44-121-1 (IET 4154) CR 20-14 (IET 3114), RP 502-36 (IET 2940), TR 18 (IET 3385) and 21939 (4080) in PVT 2 and IET 2612 and IET 4086 in UNT 3 were found to be susceptible to the brown plant hopper. Hopper burn symptoms were noted in RP4-14. Bhavani, IR. 20, IR. 22, CR. 12-178, Mala, Jayanthi and Culture 658. Co. 36 and Co. 38 were found tolerant to brown plant hopper which have to be confirmed.

R. 1. Ag. Ent. 219 Control of sorghum shootfly, *Atherigone varia soccata*

Among the seed dressing formulations, seed treatment with carbofuran and disulfoton at 5% were more effective recording 1.5 and 3.2 per cent shootfly incidence compared to 37.6% in control. They also gave increased yield of 86 and 84 per cent respectively over the untreated crop.

Soil application of carbofuran (1.8 kg a. i./ha), disulfoton (3.0) and phorate (4.0) were more toxic to shootfly showing 2.3, 3.0 and 4.0 per cent dead hearts compared to 37.5% in untreated crop. They have an increased yield of 148, 137 and 125 per cent over untreated crop.

R. 1. Ag. Ent. 220 Control of sorghum stemborer
M. S. Venugopal and M. Mani

Application of endosulfan 4% G or quinalphos 5% on 25th day and 35th day after germination at 5 and 7.5 kg/ha gave effective control of stemborer and increased the grain yield by 59.3 and 30.0 per cent over untreated crop.

R. 1 Ag. Ent. 222 Screening of sorghum varieties and hybrids for resistance to insect pests
M. S. Venugopal and M. Mani

Among 42 breeder's materials tested for shootfly resistance, SPV .9 recorded the lowest incidence of 22.6% followed by SPV. 4, SPV. 8 and SPV. 13. The entries MSH 31 CHS2 and 22E were highly susceptible.

Out of 24 parental lines evaluated for shootfly reaction Mald B is tolerant to the pest recording 9% infestation. 2277 B and SPV 16 are highly susceptible. Fifteen promising materials were screened against shootfly, U 358 recording the lowest incidence while 244 and Swarna were highly susceptible.

R. 1 Ag. Ent. 223 Control of cotton bollworms and sucking insects
A. Abdul Kareem, P. Thangavel and S. Parameswaran

The results of a trial conducted during 1974-75 on the control of cotton bollworms showed that Phosalone (Zolone) 35 EC 2.5 1/ha applied seven times at 10 days interval commencing from the 55th day of sowing recorded the minimum incidence of 14.8% of bollworms and the highest yield of 3325 kg kapas/ha in MUC 5 cotton as against 21.2% and 1683 kg/ha respectively in the untreated control. The cost of application of the chemical was Rs. 1200/ha and the additional income realised was Rs. 3,700/ha. Application of sevimol at 2.5 kg/ha was also found to be the next best.

In another similar experiment with different chemicals, monocrotophos (Nuvacron) 40 EC 0.05 per cent sprayed six times at 15 days interval commencing from 50th day of sowing registered minimum bollworm incidence along with highest yield record.

R. I Ag. Ent. 224 Varietal resistance to insect pests of cotton
A. Abdul Kareem and S. Parameswaran

Among 19 strains of cotton screened against stem weevil for their resistance, the strains CBS 156 (2.3 per cent) and Varalakshmi (2.6 per cent) were found to be resistant to stem weevil attack; the other strains CBS 25, CBS. 34, ELS. 25, ELS. 334, ELS. 380, ELS. 484, GS 23 CRH. 041, CRH 068 and Suvin recorded less than ten per cent incidence. The popular cultivated strain MUC 5 recorded the maximum 20.0 per cent incidence.

R. I Ag. Ent. 225 Control of nematodes in vegetables
C. V. Sivakumar, P. L. Lakshmanan, S. Palaniswamy and T. G. Naganathan.

Aldicarb 10G applied at the rate of 4 kg/ha, 10 days after transplanting, and followed by an irrigation, gave good control of the reniform nematode, *Rotylenchulus reniformis*. The treatment gave 8069 kg/ha more yield over the untreated, which worked out to an increase of 50 per cent. The cost of treatment was Rs. 120/ha and the additional income due to the treatment Rs. 2300/ha.

Fifty three varieties of tomatoes were screened for rasistance to two common nematodes of our soils, the root-knot nematode, *Meloidogyna incognita* and the reniform nematode, *Rotylenchulus reniforms*. SEL. 120 (IARI, New Delhi) was immune to the root-knot while LE 625 and 629

(TNAU, Coimbatore) showed a high degree of resistance. LE 625 also showed resistance to the reniform nematode.

R. I Ag. Ent. 226 Control of the major pests of *sesamum*. (including a schedule for control of both pests and diseases)
E. V. Abraham

Two rounds of foliar treatments at the 40th and 60th day with Endosulfan 0.5 kg a.i./ha combined with Dithane M 45 0.2 per cent gave significant control of the major pests, viz., shootwebber (34.68 per cent) against 65.77 per cent in control gallfly (1.61 per cent pod damage in the treatment against 13.96 per cent in control) higher yield of 216 kg/ha (74.0 per cent) over control in powdery mildew with maximum net return of Rs. 459/- per hectare.

R. I Ag. Ent. 228 Screening of varieties for resistance to pests
E. V. Abraham

Out of 930 germplasm types, 433 were found unifested by shoot webber and 568 by gallfly. Among ten F. 2 progenies tested during the period of heavy incidence of the gallfly, TMV.3 and S. I. 1878 were found to be the least susceptible with 5.95 per cent mean pod infestation against a maximum of 14.90 per cent in TMV. 3 and KRR. I. Among advanced varieties tested for shoot webber, 50-KR. 1-60 and SI 1855/1, SI 1683, SI 1740 and SI 1855 showed only 17.02 to 25.0 per cent attack as compared to a maximum of 95.24 per cent in N. 66-94 at a time of peak incidence of the pest in Epidemiology studies. (Monthly sowing trial)

June, July and August sowings had no shoot webber infestation. A high incidence of gallfly was however experienced in the sowings from June to September and again in November (24.5 per cent 63.6 per cent pods affected) and no infestation was seen in February and March sowings. The highest infection by phyllody (32.90 per cent) occured on the crop sown in the first week of November and very low incidence in January, February and September sowings.

R. I .Ag. Ent. 229 Control of lace wing bug and thrips on banana
M. Mohanasundaram and G. Santharam

Sumithion 0.1 per cent monthly spray in banana was effective against thrips attack.

R. I Ag. Ent. 230 Control of red mite on jasmine and scale insect on rose
P. M. Srinivasan and R. Govindarajan

Phoxim 0.05 per cent and Monocrotophos 0 04 per cent sprayed at 750 1/ha were the most effective for the control of scale insects. The incidence of red mite was controlled in Jasmine crop completely (100 per cent) by spraying Carbophenothion, Oxythio Quinox and Phosalone as against an increase of 150 per cent mite population in control. The cost of treatment

for Thithion 0.06 per cent and phosalone 0.07 per cent at 750 1/ha would be Rs. 170 and Rs. 120/ha respectively.

R. 1 Ag. Ent. 231 Studies on the integrated control of cotton pests and diseases
Sivagami Vadivelu and K. Narayanan

Among the treatments tried, seven rounds of *B. thuringiensis* plus sevimol at 10 days intervals has given the lowest bollworms incidence of 8.1 per cent, followed by the treatments sevimol twice and *B. thuringiensis* thrice and *B. thuringiensis* plus sevimol at 15 days intervals with 8.6 per cent and 8.7 per cent bollworms incidence respectively. The untreated control recorded the maximum incidence of 15.1 per cent. In yield of kapas also, seven rounds of *B. thuringiensis* plus sevimol treatment at 10 days interval has recorded the highest.

R. 1. Ag. Ent. 233 Control of grasshoppers and earhead caterpillar on sunflower
C. Ramakrishnan and N. Mukunthan

Application of Sevimol 2.5 g/1, Endosulfan 0.07 per cent and Fenthion 0.05 per cent sprays on the 30th and 45th day after sowing effectively controlled the white fly and jassid and gave additional yields of 70 per cent, 57 per cent and 53 per cent over control respectively. The cost of treatments worked out to Rs. 136, Rs. 181 and Rs. 145 for sevimol, Endosulfan and Fenthion fetching a net profit of Rs. 829, Rs. 598 and Rs. 585 per hectare respectively. Spraying of Endosulfan 0.07 per cent + Dithane M. 45 0.1 and Fenthion 0.05 per cent Dithane M. 45 0.1 per cent on the 30th day and 45th day after sowing controlled pests and diseases of sunflower and gave additional yields of 57 per cent and 34 per cent over control fetching a net profit of Rs. 595 and Rs. 306 per hectare respectively.

R. 1. Ag. Ent. 234 Studies on insect pollinators of sunflower
C. Ramakrishnan and N. Mukunthan

Both at 24 hours and 48 hours after insecticidal application directly on honey bees, Phosalone 0.05 percent recorded significantly less mortality than Endosulfan A. 0.05 per cent which in turn gave significantly less mortality than Endosulfan B 0.05 per cent. Phosalone 0.05 spray directly on sunflower (EC 68413) head recorded the minimum mortality of 25 percent followed by Endosulfan A 0.05 per cent registering 50 per cent while Endosulfan B 0.05 per cent gave the maximum mortality of 75 per cent after 24 hours of treatment. After 48 hours of spraying, only Endosulfan B 0.05 per cent retained its toxity, while other treatments recorded no maorality. Between the two samples of Endosulfan A and B, Endosulfan A is found to have less dermal toxicity on honey bees and seems to be more safer to honey bees when applied on sunflower heads. Endosulfan A gave significantly more yield than Phosalone which in turn recorded more yield than Endosulfan B.

R. 1. Ag. Ent. 235 Varietal screening of sunflower for insect pests
C. Ramakrishnan and N. Mukunthan

In the multiple resistance trial EC 85820 recorded the minimum grasshopper damage of 11.46 per cent as against the maximum damage of 26.08 per cent in Inra 6501 variety. But Inra 6501 recorded the minimum incidence of jassid and white fly during the season. EC 68413 and EC 112841 were found to be field resistant to *Amrasca biguttula biguttula* (below 8 jassids/ 20 levels) while EC 112842 and EC 68415 recorded the minimum incidence of *Besmisia tabaci*. One hundred and thirty two exotic cultures of sunflower were screened against the damage of *Amrasca biguttula biguttula, Bemisia tabaci, Atractamorpha crenulata* and *Myllocerus* sp. EC 68414 and EC 85817 recorded no incidence of jassid, white fly and grasshopper, while Krasno Doretz, EC 97923, EC 54641 and EC 93617 revealed no incidence of jassid, white fly and weevil and EC 100105 was found to be field resistant to jassid, white fly, grasshopper and weevil.

R.1. Ag. Ent. 236 Scheme on survelliance of pests and diseases Coimbatore district
P. V. Subba Rao and R. Ramaswamy

Survey of pests and diseases was carried out in Coimbatore District in selected farms. The pests like rice case worm, earhead bug and fulgorid bug and diseases like bacterial leaf blight, helminthosporium leaf spot and foot rot of rice appeared in large proportion compared to previous year to considerable damage during samba season. The incidence of *cholam* stem-borer, leafspot, redhairy caterpillar and tikka leaf spot of groundnut, black-gram of cotton, sugarcane smut, Frog eye of Tobacco little leaf of Brinjal and leaf curl of chillies were found in several places.

R.1. Ag. Ent. 238 Schemes for studies on the nematode parasites of banana
P. Rajagopal, Sivagami Vadivelu and A. M. Chinnarajan

Spread of the banana burrowing nematode, *Rodopholus similis* and the lesion nematode *Pratylenchus* sp. can be controlled through disinfestation of suckers by 'Pralinage' method. In this method the necrotic tissues are trimmed and suckers dipped in clay slurry. Then carbofuran 3 per cent granuls sprinkled at 42 gm/sucker, and plasted. By this method, maximum yield of 64556 kg of banana/ha has been realised as against 41842 kg of banana/ha in the control.

R.1. Ag. Ent. 239 Screening for pest resistance in pulses
C. R. Gunasekaran and D. Kumaresan

Blackgram : The type No. 55 showed resistance to the stomfly, *Melan-gromyza phaseoli* and the pod borer, *Catechrvsops cnejus*. Out of 318 varieties of blackgram screened, 16 varieties viz., Karaikal, P58, P47, Udgir,

L35-5, B-1-Done, Kilikulam, Kargoan-3, Chicknabreak, T65, Vilakudi, Coconada, Tenkasi, 338/3, No. 55 and US 131 were found to be good in their stand almost throughout the year and most promising for resistance to the stemfly recording less than 10 per cent incidence.

Greengram : Out of 164 varieties screened, 17 varieties viz., PLS 226, 267/1, 279, 336, 337, 338, 239/1, GI, T. V. Malai, NA 5, NA 9, 1725/1-3, 1732, MS 9720/2, 1734/1-3, 1789/3 and Co 1 were found to have a good growth throughout the year and less susceptibility to *M. phaseoli* recording less then 16 per cent incidence. The 14 varieties except the three PLS 266, GI and MS 9720/2 in above said varieties, were found to be tolerant to pod borer, *C. cnejus*, recording less than 30 per cent incidence.

Bengalgram : Out of 126 varieties screened, the varieties BG 7, No. 24, C 104, C 214, 62-14, No. 2965, T 68, No. 408, Alex, PLS 137, CC 602, T 53, Co. 1 Sp2. BR 77, Jabalpur, BR 98, Gwaliar, Col. Sp 5, Col Sp. 4, Palladam, G130, R 56-B, Col, No. 112, T2, T3, PLS 119, No. 78-2, T 685, T. 44 and RS-11-SP were found to be less susceptible to pod borer *Heliothis armigera* recording less than 4.5 per cent incidence. The varieties S.18, Co. 2, ST1, PDM and Col were found to be less susceptible to major pests including borers of redgram while S 18 showed tolerance to the pod borer also, recording 20 per cent incidence.

R. I. Ag. Ent. 240 Bionomics and control of the mango stemborer, *Batocera rufomaculata* in Tamil Nadu.

P. C. Sundara Babu, M. S. Palanisamy and T. Surulivelu

Survey conducted in 13 mango growing districts of Tamil Nadu indicated that the infestation by stemborer was high in the districts of North Arcot and Tiruchirapalli. The varieties Amlet, Mulgoa, Gundu, Banganapalli, Jehangir and Rumani were found to have more than 20 per cent incidence. In the control of the mango stemborer, application of half or one tablet of phostoxin per bore hole and immediately plastering the bore hole with wet earth gave very good control of the pest. The cost of one phostoxin tablet is 30 paise.

R. I. Ag. Ent. 245 Control of gram pod borer, *Heliothis armigera*

S. Jayaraj and A. Regupathy

Two field trials were laid out under rainfed conditions with Co. 1 bengal gram with dust and emulsion concentrate formulations. Dust formulation was found to be effective than spray application. Endosulfon dust was found to be more effective in controlling the pod borer than malathion, lindane and carbaryl. When applied as foliar spray, monocrotophos, fenitrothion, endosulfan and ambithion gave effective control followed by chlorpyiphos, dicrotophos and quinalphos.

R. 1. Ag Ent. 248 Survey of insect pests of *Parthenium hysterophorus* and *Solanum eleagnifolium* for the possible biological controle of these weeds
S. Jayaraj and S. Kumar

Phenococcus lilacinus was found to feed and multiply on *Parthe-niem* and *S. eeagnifolium* and kill the plants in about 6 weeks in the former and in about 2 weeks in the case of the later.

R. 1. Ag. Ent. 101 Studies on South Indian Weevils *(Curculionldae)*
T. R. Subramaniam, P. Thangavel and S. Parameswran.

In the insecticidal control trial conducted during 1974-75 at Bhavnisagar against cotton stem weevil *Pempheres affinis*, four sprayings given at 15 days interval commencing from 15-th day of sowing with 0.1 per cent diteldrin recorded 5.6 per cent incidence as against 20.2 per cent in the untreated control. Among granular insecticides carbofuran 3G and disulfoton 5G at 1 kg a. i/ha applied at sowing recorded 9.4 per cent and 9.9 per cent incidence respectively as against 22.1 per cent in control.

R.1. Ag. Ent. 104 Studies on antifeeding compounds
A. Abdul Kareem

Three field studies were conducted with different treatments consisting of two antifeedants viz. TTA and TTH, each at two concentrations viz. 0.05 and 0.025 per cent and eight organic insecticides and a control against the peanut leaf foldcr *Stomoptery x subsecivella* Zell. It was observed that not only the incidence of the pest was significantly less in treatments with antifeedants sprayed twice at triweekly interval coinciding early incidence of pest in all the trials, but also there was reduction in the actual feeding in the leaf folds formed, to the extent of 75.0 to 90.0 per cent. In addition, both the antifeedants recorded the maximum yield increase ranging from 72.4 to 109.3 per cent in two of the three trials.

R.1. Ag. Ent. 105 Studies on insect parasites and predators

Successful parasitisation upto 60 per cent was obtained when 75 medium sized *Corcyra* larvae were exposed to 15 female parasites for 3 hours. The egg, larval and pupal period of the parasite has been noted to be 2, 7 and 4 days respectively. The average longevity and fecundity of the parasite *Eriborus trochanteratus* when reared on *Corcyra cephalonica* was noted to be 8.4 days and 38.8 eggs/female respectively.

R.1. Ag. Ent. 107 Preservation of seed material from insect infestation
P. M. Srinivasan and R. Govindarajan

Treatment of green gram seeds with groundnut oil. coconut oil, gingelly oil and Neem seed oil at 1 per cent ratio had preserved the same free from

infestation and damage for a period of 8 months inspite of introduction of five pairs of pulse beetles every month, while 100 per cent damage within 2 months of storage was observed in the control, without affecting the germination of the seeds.

In another trial with greengram and redgram seeds, the three domestic edible oils, viz., groundnut, gingelly and coconut oils have been mixed at 0.3 per cent, 0.5 per cent and 1.0 per cent ratios and in the case of red gram in addition to the above, neem oil extract has also been included. The observations for 2 months indicate that the greengram and redgram seeds under the 3 oil treatments were free from infestation and damage while the untreated control seeds of green gram displayed 90 per cent damage and redgram 6.6 per cent damage in a period of 2 months storage. For the protection of 100 kg of pluses seeds from infestation and damage by pulse beetle one kg of any one of the following oils viz., groundnut, coconut or gingelly may be mixed which would cost Rs. 5.50, 10.00 or 8.00 respectively.

R.1. Ag. Ent. 109 Studies on Insect pathogens
S. Jayaraj, K. Narayanan and Jebamoni Rabindra

Studies on the effect of pH on the infectivity of nuclear polyhedrosis virus of *spodoptera litura* revealed that maximum mortality occured when the virus was at neutral pH and decrease in mortality occured at both extremes of pH viz., acid and alkali range. A preliminary observation on the efficacy of nuclear polyhedrosis virus in controlling the larvae of *Amsacta albistriga* revealed that 60 per cent mortality occured when the virus was applied at a concentration of 10^{10} polyhedral inclusion bodies per ml. The highly susceptible *Papilio demoleus* larvae to *Bacillus thuringiensi* contained more of bicarbonate and sparce microflora in the gut than the non-susceptible *Spodoptera litura.* Mixed infections of *Bacillus cereus* and *Steptococeus* sp. was noticed in *Pectiusphora gossypiella.*

R.1. Ag. Ent. 110 Taxonomic studies on the Plant parasitic nematodes
T. S. Muthukrishnan and G. Rajendran

Taxonomic studies on the ring nematodes, were continued and four species - *Hemicriconemoides stictatathicatus, H. cocophillus C. citri* and *Hemicycliophora travalensis* were determined. In addition the needle nematodes, *Longidorus africanus* and two species of Paralongidorus were collected from the soils of Tamil Nadu and identified.

R.1. Ag. Ent. 111 Studies on the population dynamics of plant parasitic nematodes
T. S. Muthukrishnan and G. Rajendran

The plots grown with Marigold, redgram, sunnhemp, coriander and treated with DD recorded 87.43, 49.21, 37.82 and 61.43 per cent increase in yield over the crop raised in the fallow plots.

R. 2 Ag. Ent. 101 Physiopathology of certain insect pests affected by various microbial pathogens

V. T. Sundaramurthy and N. R. Mahadevan

The egg masses of red hairy caterpillar, *Amsacta albistriga* were treated with nuclear polyhedrosis virus at various concentrations viz., 10^8, 10^7, 10^6, 10^5 and 10^4 polyhedra/ml and it was found that the hatched larvae had acquired the virus in all the levels and resulted in a maximum mortality of 83.4 per cent at a concentration of 10^8 polyhedra/ml within four days.

On further experiments to find out the minimum acquisition feeding period, it has been observed that one hour feeding upon virus treated leaves is sufficient to cause 80 per cent mortality of the larvae.

Among various food materials, namely, the leaves of cotton, sorghum, redgram, cowpea, gingelly, groundnut and brinjal treated with viral suspension with a concentration of 10^7 polyhedra/ml and fed to fourth instar larvae *Amsacta*, the leaves of cotton and gingelly were found to produce maximum mortality of 40-47 per cent within 4 days.

R. 2 Ag. Ent. 201 Chemical control of rice pests

M. Gopalan and N. Chandramohan

A trial was laid with rice CO. 36 to study the persistence of different granular insecticides viz. Carbofuran 3 per cent, Diazinon 10 per cent, Chlorfenvinphos 5 per cent, Thiometon 5 per cent, Monocrotophos 5 per cent and AC 92100 5 per cent in the soil. All the granules were applied at a concentration of 1.5 kg a.i./ha andt his was compared with phosalone 0.07 per cent foliar spray and untreated check. Among the treatments, Carbofuran 3 per cent G recorded the highest yield of 5165 kg/ha; the cost of treatment works out to be Rs. 1300/-ha and the net profit Rs. 1325/ha. The leaf roller incidence was significantly reduced by the application of carbofuran 3 per cent as well as by phosalone 0.07 per cent. The above two treatments recorded 2.38 and 7.13 per cent incidence of leaf roller as against 23,84 per cent in the control plots. Carbofuran, Diazinon and Quinalphos treated plots recorded a lesser incidence of gall fly viz. 9.82, 12.10, 15.58 per cent respectively, whereas it was 32.86 per cent in the untreated check. whorl maggot incidence upto 19.C4 per cent was noticed in control plots but Carbofuran and Diazinon treated plots recorded only 3 per cent incidence.

In another trial, effect of nursery treatment of different systemic pesticides on 15 days old seedlings was observed with the insecticides viz. Carbofuran, Diazinon, Phorate and Quinalphos at a concentration of 0.5 and 1.0kg a.i/ha. The toxicity persisted upto 30 days after planting and all the treatments showed increased vigour of the seedlings as recorded by increased shoot and root weight.

A dose of 2.5 kg a.i/ha showed phytotoxic symptoms in the seedlings and hence not recommended.

R. 2 Ag. Ent. 202 Studies on the varietal resistance to stem borer, leaf roller and gall fly in paddy
V. T. Sundaramurthy and C. S. Deivavel

Eighty three varieties of rice were screened for their resistance to major pests of paddy and found a minimum incidence of 1.02 per cent of gall fly in the culture W. 1263 whereas a maximum to the extent of 50.56 per cent was noticed in G. M. R. 5. The variety Kakatiya was observed to be resistant to leaf roller recording 1.80 per cent incidence while culture 4609 was found to be susceptible with 29.11 per cent incidence.

R. 2 Ag. Ent. 203 Infestation control of storage pests
T. Kumaraswami and M. Swamiappan

The procedure for large scale production of activated white clay was standardarised with certain modification in the method given by Central Food Technological Research Institute, Mysore. The china clay from Neyveli was used to convert into insecticidal clay. For washing the clay after acid treatment a centrifuge developed by Farm Mechinery Department, Tamil Nadu Agricultural University was used.

There was no deleterious effect on germination of treated cowpea seeds after four months of treatment at 10 gm of clay powder/kg of seed. The maize seeds treated with activated white clay at the same rate could be protected for 150 days from infestation by *Sitophilus* sp. The mode of action of clay powder on *Bruchus* was found that the particles adsorb the waxy molecules from the exoskeleton, facilitating loss of moisture from insect body resulting in death.

The clay treated food grains and food mixture were not found to affect the white albino rats which were fed for 30 days with treated product. The slight inhalation effect expressed by inflammation of lung alveoli was reversible within a month of post-treatment period.

R. 2 Ag. Ent. 205 Investigations on the varietal resistance in redgram and lab-lab against pod borers
T. Kumaraswami and K. Gunafilagaraj

Among 121 varieties of redgram tested for their resistance to the various pod borers, a few varieties, namely AC. 48, AC.53, AC. 104, AC. 154, AC. 172 and Muktha were found to be resistant, recording only 2.3 to 6.5 per cent infestation of flowers of pods when maximum infestation upto 49.4 per cent was noticed in varieties like LST-2-354.

R. 2 Ag. Ent. 206 Investigations on the varietal resistance of *bhendi* and brinjal to red spider mite
T. Kumaraswami and K. Gunathilagaraj

Among 50 varieties of *bhendi* tested, the variety Clemsons Spineless was consistantly found to be resistant to the red spider mite.

R. 9 Ag. Ent. 201 Chemical control of rice pests
(a) Chemical evaluation trial-I (Granules)
(b) Chemical evaluation trial-II (Spray)
K. C. Chandy and S. Kuppuswamy

Application of granules viz. Dursban 0.02 per cent, S. D., Birlane (10G) 1.0 kg a.i/ha at 20, 40 and 60 DAT in Jaya variety was the most effective in controlling whorl maggot and gall midge incidence. The application of Galecron 3G, Mipcin 4 G, at 1.0 kg a.i/ha applied on 29 and 51 days after transplanting checked the leaf folder incidence and maximum protection treatment came next in the order of efficacy.

Spraying of Dursban 0.02 per cent, S. D., Birlane 10 G at 1.0 kg a.i/ha on 20, 40 and 60 DAT in Jaya variety was very effective in controlling whorl maggot and gall midge incidence.

R. 9 Ag. Ent. 203 Seedling root dip experiment
K. C. Chandy and S. Kuppuswamy

Seedling root dip was superior to other treatments in controlling whorl maggot incidence. The chemicals Nuvacron, Birlane and Padan were also on par with Dursban.

R.15. Ag. Ent. 201 Insecticidal trial for the control of leaf miner in groundnut
A. N. Venkateswaran and M. S. Palaniswami

Five insecticides and two bacterial treatments were tried against the leaf miner *Stomopteryx subsecivella* zell, in 1975 *kharif* and all of them significantly reduced the pest incidence. The chemicals were more effective than the bacterial treatments. Among the insecticies, Lebaycid (0.2 per cent) Parathion (0.05 per cent) and Nuvacron (0.1 per cent) were on a par and superior to all other treatments.

R.18. Ag. Ent. 201 Screening of germ plasm and other breeding materials for jassids and other sucking pests
P. Thiagarajan

Among 150 varieties screened during 1975 winter, one variety viz. IC 1430 was observed to be highly tolerant to jassids recording grade I in all the five scorings made at different phases of the crop growth. This variety is being utilised for evolving resistant types.

R.19. Ag. Ent. 201 Survey for incidence of insect pests of important crops in Pondicherry region
A. Mohamed Hanifa

Periodical observations were taken in selected farms in all the Communes of Pondicherry region for incidence of insect pests on important crops. The incidence of rice leaf thrips were observed in *Kuruvai* nurseries of Bahur, Ariyankuppam, Mudaliyarpet, Villianur and Olgaret communes of Pondicherry. Moderate to heavy incidence of Fulgarid infestation in *Kuruvai* crop was observed in Karaikal in the month of September and October. Wide spread infestation of rice leaf roller was observed in *samba* crop in the month of November in Villianur, Olgaret, Mudaliarpet, Ariyankuppam and Bahur Communes. Heavy infestation of rice earhead bug was noticed in Mudaliarpet, Pondicherry, Olgaret and Villianur Communes in *samba* crop of rice. There was one brood emergence of rice stem borer moths in the first week of December in Villianur, Olgaret and Mudaliarpet Communes and another one which was well pronounced in Bahur commune only by first week of February.

Moderate infestations of red hairy caterpillar, *Heliothis armigera* and root grub were observed in Kalapet of Olgaret Commune in the third and fourth week of August in rainfed groundnut.

5. PLANT PATHOLOGY

R.1. Pl. Path. 202 Control of diseases of maize
T. K. Kandaswamy and G. Krishnamohan

In the varietal screening studies, Maize varieties EH 7768, 7791, 7814, 7875 and 7876 were free from *helminthosporiose*, while Bogor comp. B., Chair cross Syn (Yel), MLT., Ph. 9, DMR., Eto-1., Carribbean-Cuba-P. lico Guad x Phil. 2., Nariono-330, CM-105-3-3-3-f, were free from the downy mildew diseases. Downy mildew in a severe form could be observed in July, October and November sown crop.

R.1. Pl. Path. 205 Control of Tikka disease of Groundnut
R. Jeyarajan, T. Jaganathan and K. Sivaprakasam

Dithane M.45 (0.25 per cent) / or Benlate (0.1 per cent) or Duter (0.25 per cent) when sprayed at 45, 60 and 75 days after sowing effectively controlled tikka leaf spot, giving a net profit of Rs. 700, 420 and 260/ha respectively.

R.1. Pl. Path. 206 Control of major diseases of tomato, brinjal and *bhendi*
Lakshmi Ramakrishnan

In the fungicidal trial on the control of *Alternaria* leaf spot of tomato which was repeated, 0.2 per cent Dithane M-45, 0.1 per cent Difolatan or Daconil not only controlled the disease but also resulted in increased yields thus confirming the previous findings. Out of 200 types, LE 297 was found

to be tolerant to leaf spot under field conditions. Soil drench with 0.025 per cent Dexon, 0.1 per cent Benlate and 0.1 per cent Wet Ceresan controlled wilt and root rot diseases of tomato and brinjal. Out of 215 types of tomato, eight types viz. LE 342, 414, 430, 518, 544, 599, 571 and 612 were tolerant to wilt disease. Soil drench with 0.025 per cent Dexon, 0.25 per cent Blue copper and 0.1 per cent Wet Ceresan controlled damping-off disease of tomato and brinjal. Three sprays at fortnighly interval commencing a month after sowing with 0.1 per cent HMP MBC and Bavistin reduced powdery mildew incidence in bhendi and also increased the yield by 30.6 and 18.1 per cent respectively over control. Three rounds of sprays with 0.1 per cent Benlate or 0.5 per cent Wettable sulphur was found to be optimum and also more economical than two and four rounds of sprays for the control of powdery mildew in bhendi. Out of 83 types of *bhendi*, AE 138, AE 172 and AE 177 showed 5 to 10 per cent powdery mildew incidence under field conditions. Loss in yield of pod due to powdery mildew was found to vary from 25 to 35 per cent in the variety 'Pusa Sawani'.

R.1. Pl. Path. 208 Studies on virus-vector relationships of important virus diseases of tomato, *bhendi*, chillies and cucurbits and evolution of suitable control measures

S. Chelliah and Sellammal Murugesan

Seed treatment with Agrosan G. N. (2g/kg) followed by application of Aldicarb granule at 1.0 kg a.i/ha, a week after sowing; spraying Endosulfan 0.07 per cent at 30 days after sowing and Endosulfan 0.07 per cent + Wettable Sulphur 0.5 per cent at 50 and 65 days after sowing was very effective in controlling all insect pests, virus vectors, mites, nematodes, fungal and viral diseases of *bhendi* and resulted in an additional income of Rs. 3465/- per hectare.

Soil drenching of tomato nursery with wet ceresan 15 days after sowing followed by application of Aldicarb granule at 1.0 kg a.i /ha, 7 days after transplanting and spraying with Dithane M-45 0.2% at 30days after planting and Dithane M.45+ Endosulfan 0.07% spraying at 45 and 60 days after planting was very effective against white fly vector, nematodes and leaf curl incidence. Through these treatments an additional income of Rs. 10,065/-- could be obtained per hectare.

Application of Carbofuran granule at 1.5 kg a.i/ha twice at 15 and 60 days after transplanting or spraying Fenthion 0.05 per cent or Methyl demeton 0.025 per cent six times at fortnightly interval from 21 days after transplanting significantly reduced the mosaic indicence in chilli. Application of carbofuran granule resulted in increased yield with a profit of Rs. 5320/ha.

R. I. Pl. Path 209 Investigations on diseases of ornamental crops

T. Jaganathan, K. Ranganathan and V. Mariappan

Crossandra plants treated with Phorate 1 g/plant and soil drench with Brasicol (0.1 per cent) exhibited lesser incidence of wilt disease.

R. I. Pl. Path. 212 Mushsroom cultivation

T. K. Kandaswamy and K. Ramaswamy

Modification of the straw bed instead of square beds gave good yield and savings in straw used. Partially dried tamarind and neem leaves proved better than completely dried or fresh leaves. It is desirable to harvest mushroom at button elongation stage for better storage. The protein content declined atfer egg stage of the mushroom.

Pleurotus sajor caju: The nitrogen fixing character of this mushroom was recorded It fixed 5 – 6 per cent N in sporophores, 2-2 5 per cent in substrate and 2.9-3.5 in mycelium. Of the several substrates tried good yields were recorded in paper wastes, tapioca thippi, groundnut shell, choppings of fresh *Canna indica* and vegetables wastes like *bhendi*. The *in vitro* studies revealed the optimum pH as 6.0, maltose as best carbon source, and organic nitrogenous materials as the best N source. A temperature of 30°C was found to be optimum for growth. The nitrogen enrichment was maximum in maize cob waste.

The performce of the three species viz., *P. Sajor caju*, *P. flabellatus* and *P. ostreatus* was studied. Since the temperature requirement of the latter two species was critical 20-25°C for *P. flabellatus*, 18-21°C *P. ostreatus*) poor yields were recorded. *P. sajor caju* spent waste incorporation to soil increased the yield of cereals like paddy and maize both in pot culture and in mini-plots. Growth regulators like IAA increased the number of mushrooms but not the total yield. GA increased the protein content. Humidity 60-70 per cent and temperature below 32°C are needed for good yield.

R. 1. Pl. Path. 213 Studies on rice diseases with particular reference to varietal screening for disease control.

C. L. Subramanian, G. Ramakrishan and S. Natarajan

The rice cultures, IET 2397, IET 2864, IET 2901 and IET 2996 were moderately resistant to brown spot. This disease was found to occur in a severe form during November to March. Low temperature and high humidity favoured the disease incidence. The number of cold days recording a temperature of less than 20°C appeared to have a bearing on disease incidence but not the rainfall. Loss in yield due to sheath rot caused by *Acrocylindrium oryzae* was from 5 to 30 per cent in the different varieties depending on the intensity of infection. Rice varieties Raminad, Sigadis, Kanto, Teetep, ADT. 10 PVR. 1 and TKM. 6 were not infected under field conditions while

Bhavani, Jaganath, Ponni and TN.1 showed less than 10 per cent infection The disease was found to increase with increased nitrogen.

IET 3104, IET 3105, IET 3259, IET 3261 and IET 4080 showed resistant to sheath blight caused by *Thanetophorus cucumeris*. While Co.36 and IR. 20 were moderately resistant to sheath rot and sheath blight, TKM 6, Co 34 and Seeragasamba exhibited resistance to bacterial leaf blight.

R. 1. Pl. Path. 214 Evolving mass screening techniques for brown spot (*Helminthosporiose*) disease
C. L. Subramanian and G. Ramakrishnan

The concentraled culture filtrates containing the toxin produced *in vitro* by *Helminthoaporium oryzae* isolates were found to cause symptoms of wilting in paddy seedings. But no differences among the varieties in their reaction to the toxin could be observed.

R. I. Pl. Path. 215 Control of disease of sorghum and varietal screening to various diseases
Kousalya Gangadharan and N. Subramaniam

Among 34 parents used in hybridization programme of sorghum CS. 3541, CS 3541 (R6), CS 3541 (R9) CS 3541 (RIO) IS 3541, CS 3687, U Ch V 1 and U Ch V 2 were moderately resistant to downy mildew both in field and green house conditions.

CS 3541, IS 3541, CoH 2 and CSH 6 were moderately resistant to head moulds and foliar diseases in green house screening tests. The loss in grain yield of cholam due to rust was found to be negligible since the disease appeared in 45–50 days old crop.

R. I. Pl. Path. 216 Control of ergot disease of cumbu
C. Parambaramani and M. Muthusamy

Out of 32 types of germplasm showing field tolerance to ergot in cumbu, 10 types developed ergot incidence when tested under artifically inoculated condition. All the entries in September sown crop showed ergot disease thus confirming earliest findings.

R. I. Pl. Path. 217 Screening of cumbu varieties for resistance to downy mildew (green ear) and rust
C. Parambaramani and M. Muthuswamy

Only 126 D3A, out of the ten male sterile lines screened in cumbu was resistant to downy mildew

R. I. Pl. Path. 218 control of *ragi* blast disease
C. Parambaramani and M. Muthusamy

Ragi types MS 117, 570, 571, 2928, 2929 and 2930, TNAU 9, 24 and 30 exhibited tolerance to blast under field conditions.

R. I. Pl. Path. 220 **Studies on cotton diseases**
Thangamani Narayanaswamy and A. Vinayagamurthi

A nematode, *Hoplolaimus* sp. was found to be associated with the incidence of *Fusarium* and *Verticilluim* wilts in cotton. Simultaneous inoculation of fungus and nematode hastened wilting. Soil application of Nemagon (18 1/ha applied 45 days after sowing) or Bavistin (0.025 per cent) or Kocide 101 (0.2 per cent) drenched thrice at monthly interval, first being 45 days after sowing, resulted in the control of *Verticillium* wilt by 14.5, 8.7 and 5 per cent respectively, and resulted in increased yield of kapas over control, the per cent increase being 77.2, 32.7 and 27.2 respectively. Four cultures viz., 4418, 1614, 441 B and BLS 294-2-6 were resistant to *A. bataticola* under greenhouse conditions.

R. I Pl. Path. 221 Investigations on the control of decay of fruits and vegetables during storage
K. Seshadri and K. Mohammed Usman

Benlate at 500 and 1000 ppm gave effective control of storage decay of papaya, the percentage decay being 0.75 per cent as against 37.5 per cent with the untreated control, after 7 days of treatment. Storage decay of tomato, caused by *Fusarium* sp., was checked by Benlate, Thiobendazole and Aureofungin, both as prophylactic or curative, at 1000 ppm. The storage life of treated fruits was 15 days while the untreated ones rotted in 10 days.

R. I Pl. Path. 222 Studies on diseases of *sesamum*
N. Shanmugam and Ramakrishnan

Foliar application of either Miltox at 2.5 kg/ha or Dithane M. 45 at 2 kg/ha on the 40th and 60th days after sowing was most effective against *Alternaria* blight of *sesamum* besides increasing the yield by 32.6 to 35.8 per cent over no treatment, resulting in a net monetary gain of Rs. 300 to Rs. 350/–ha.

Two sprayings with Wettable Sulphur 0.2 per cent combined with Dithane Z. 78, 0.2 per cent was most effective and recorded 485 kg/ha; while dusting of sulphur at 20 kg/ha gave 448 kg/ha (45.6 and 34.5 per cent increase in yield over no treatment), and the net return was Rs. 45 and Rs. 360/ha respectively. Seed treatment with Captan 0.3 per cent was found to be most economical and effective in reducing *Rhizoctonia* root rot. Foliar applications of Miltox 0.25 per cent or Dithane M. 45 0.2 per cent combined with either Endosulfan 0.5 kg a.i/ha or Fenthion 0.5 kg/ha on the 40th and 60th day after sowing, not only resulted in the effective control of *Alternaria* blight, powdery mildew, shoot webber cum capsule borer and aphids, but also resulted in appreciable increased yields giving a net monetary gain upto Rs. 700/ha.

In the studies to develop *Sesamum* varieties possessing multiple resistance against important diseases, the varieties E-1036, Si 1002, Si 2556, Si 2563, Si 2776 and F_2 of Si 2878 x TMV 3 were free from phyllody. Si 1683 and Si 2799 were moderately resistant to powdery mildew.

R. I Pl. Path. 225 Studies on virus diseases of groundnut
P. Narayanasamy and M. Ramiah

Groundnut types viz., *Ah* 35, 6677, 7043 and 7284 showed tolerant to ring mosaic under controlled conditions out of 146 types tested. *Tridax procumbens, Solanum nigrum, Comelina bengalensis* and *Daincha* were infected by groundnut ring mosaic virus. The incidence of the diseases on POI. 1 was reduced by elimination of virus sources (EVS) by closer spacing (20 x 15 cm), by roguing out infected plants early. The yield was significantly increased by one spray of Nuvacron (500 ml/ha) a month after sowing or application of Solvirex (30 kg/ha) 10 days after sowing in addition to closer spacing and elimination of infected plants. The percentages of yield increase with treatments EVS+Nuvacron (1 spray) and Solvirex respectively were 42.8 and 56.9 over control giving net profit of Rs.1400/- and Rs. 1290/-ha.

R. 1. Pl. Path. 226 Control of diseases of sunflower
V. Narasimhan and A. Sindha Mathar

In the epidemiology studies, the sunflower sown during the second week of May to the end of November recorded very high incidence of rust while December to March sowing recorded low incidence. Two cultures viz., EC. 85820 and EC. 89093 exhibited tolerance to rust (less than 10 per cent incidence) but were moderately susceptible to *Alternaria* leaf blight. Two hybrid cultures viz., X 7440 and X 7441 also showed tolerance to rust. Two sprayings with 0.1 per cent Dithane M-45+0.05 per cent Fenthion, 30 and 45 days after sowing effectively controlled rust, leaf blight and major pests of sunflower, and also resulted in an increased yield of 57 per cent and 34 per cent (with a net profit of Rs. 595 and Rs. 395/ha) respectively.

R. 1. Pl. Path. 227 Studies on the role of seed-borne microflora on quality of seeds.
P. Vidhyasekaran and G. Arjunan

Aspergillus flavus found on the blackgram seeds was antagonistic to *Rhizoctonia bataticola*. High concentrations of *R. flavus* on seeds increased seed germination percentage, seedling vigour in soil infested with *R. bataticola*.

R. 1. Pl. Path. 229 Studies on diseases of crop plants caused by mycoplasma like organism
P. Narayanasamy

Incidence of phyllody disease on *Jasminum, auriculatum J. pubescens, J. sambac* variety 'gundumalli' was observed. No remission of disease

symptoms in the treated plants could be observed when the phyllody-infected 'gundumalli' plants were sprayed thrice at weekly intervals with Tetracycline hydrocloride, Oxytetracycline hydrocloride, Chlortetracycline hydrochloride, Erthromycin stearated and Agrimycin 100, Of the 223 germplasms cultures of bengalgram, only 2 types were infected with phyllody under natural conditions. None of the 35 brinjal varieties showed symptoms of little leaf disease under natural conditions. All the 5 varieties tested under controlled conditions were susceptible to little leaf disease.

R. 1. Pl. Path. 230 Studies on virus diseases of pulses
K. S. Subramanian

Out of the 56 types of blackgram assessed for their reaction to leaf crinkle and sterility mosaic, 57 and 19 types were tolerant to leaf crinkle and sterility mosaic respectively. In the crops sown during March, April, May, July, September and December, the incidence of leaf crinkle was 10-13 per cent whereas in other months it ranged from 4.7 per cent. Three sprays of Sevimol 0.1 per cent or Metasystox 0.025 per cent or Nuvacron 0.05 per cent reduced leaf crinkle and increased the yield and gave a net income of Rs. 543, Rs. 492 and Rs. 262 per hectare respectively. Out of 360 greengram types screened for resistance to yellow mosaic 143 were found susceptible. Out of 76 cowpea types screened for resistance to mosaic, 35 were tolerant to the disease.

R. 1. Pl. Path. 231 Studies on diseases of pulses
P. Vidhyasekaran and G. Arjunan

In blackgram, the types AC 282 and AC 307 showed less than 10 per cent root rot *(Macrophomina phaseoli)* incidence for eight season. The disease resistance in No. 1792, Warangal and Chicknabroak broke down after the severe attack of stem fly (*Melanagromvza phaseoli*). The types P. 49 and US. 131 were less susceptible to the tip blight (*M. Phaseoli*) during all the eight seasons tested. Four types viz., AC 211, 222, 221 and P. 49 were free from leaf crinckle under field conditions but were susceptible under green house conditions. In greengram, LM 220 and MS 9385 were resistant to root rot (*M. phaseoli)* both under field and green house conditions. LM 220 was also free from yellow mosaic under field conditions, but under green house conditions it was moderately susceptible. In redgram a selections S 18 was resistant to root rot *(M. phaseoli*) and less susceptible to wilt (*Fusarium oxysporum, f. udum)* also. In bengal gram two germplasm types, T 65 B and PLS 9, were tolerant to the wilt *(F. solani* and *F. oxysporum).* The type PLS 9 showed resistance to the root rot also.

R. 1. Pl. Path. 232 Control of leaf spot and rhizome rot of turmeric
K. T. Subba Raja

Four spray applications at an interval of 20 days commencing from August with Daconil 0.1 per cent and Difolatan 0.1 per cent were effective

against turmeric leaf spot recording a disease per cent of 16 and 18 respectively while in the unsprayed control the disease per cent was 50. Among the 32 varieties tested one variety 'Sugandam' was resistant. Rhizome rot of turmeric was found to be very heavy in black soils (30 per cent) less in red loamy soils (16 per cent), nil in sandy soils. In general mature rhizomes were readily infected and the infection was found to commence from the first week of December. The mother rhizomes were mostly infected by *Fusarium* sp. where as the young finger rhizomes are affected by *Pythium* sp.

R. 1. Pl. Path. 233 Studies on yellow mosaic of *Dolichos lab-lab*
K. S. Subramanian

Plants inoculated at the age of 15 days recorded a maximum reduction of 72 per cent followed by the plants inoculated at 30, 60 and 45 days old. The yield components and other plant traits such as height of plant, weight of shoot, length and weight of root, mean number of pods per plant, mean weight of 100 pods and weight of seed were also reduced in infected plants. Virus infection reduced the percentage of protein in seed by 18.6 per cent. The incidence was less than 10 per cent when sowings done during June to September and in other months, it ranged from 10 to 22 per cent the highest being in in October-sown crop. All the nine insecticides tested could reduce incidence of the disease and increase the yield significantly. Spraying sevimol 0.1 per cent or Nuvacron 0.05 per cent thrice at fortnightly interval, the first commencing 30 days after sowing recorded a net income of Rs. 1021 and Rs. 458/ha respectively.

R. 1. Pl. Path. 234 Control of Betalvine wilt disease
V. Narasimhan

Drenching with 0.5 per cent Bordeaux Mixture, one per cent F. M. spray or 0.25 per cent Copper oxychloride once a month from November to February effectively reduced the wilt disease of betalvine. Mulching the beds with rubber waste, fresh 'agathi' leaves, charcoal powder or with transparent polythene sheets did not control the wilt disease.

R. 1. Pl. Path. 235 Studies on disease of tuber crops with special reference to tapioca, sweet potato, yams etc.,
K. Sivaprakasam and C. Krishnamohan

A new leaf spot disease of sweet potato caused by *Alternaria capsiciannui* Savul. and Sandu and a new tuber rot of tapioca caused by *Fusarium solani* (Mart.) Sacc. were recorded. Dipping of tapioca setts for 15 minutes in any one of the chemicals like Vitavax 0.1 per cent, Bavistin 0.1 per cent, Benlate 0.1 per cent and Thiram 0.2 per cent was effective against sett rot disease caused by *Diplodia natalensis*. Rhizome rot of elephant yams in the market has been found associated with *Sclerotium rolfsii* which caused rotting of yam, colacasia, carrot, beet root, radish, tapioca, sweet potato and potato also.

R. 1. Pl. Path. 236 Investigations on the entomogenous and entomophagous fungi
K. Ranganathan

Paecilomyces sp. isolated from infected caterpillars of *Prodenia* sp. on tomato caused 5 per cent mortality of the caterpillars in 3-7 days of inoculation.

R. 1. Pl. Path. 237 Studies on the anthracnose disease of *D. lab-lab.*
K. Ranganathan

Ziram, Dithane M 45, Dithane Z 78, Duter and Difolaton were effective in controlling anthracnose of *Dolichos lab - lab* and also resulted in an increased yield of 16 to 19 per cent over the control.

R. 2. Pl. Path. 207 Studies on downy mildew (green ear) of cumbu
M. N. Alagianagalingam and N. Srinivasan

Varietal trials with two new cumbu UCV 1 and UCH 1 were conducted under field condition with HB 3 cumbu as control. UCV 1 and UCH 1 recorded only 5.2 per cent and 3.1 per cent of green ear disease incidence while HB 3 variety showed 55 per cent of the disease incidence.

R. 2 Pl. Path. 208 Studies on Bunchy top disease of banana
C. V. Govindaswamy and P. Padmanaban

When bunchy top infected banana suckers were subjected to aerated steam therapy at 50°C, 53°C and 55°C for varying durations ranging from 30 minutes to 3 hours, the virus was not found to be affected as evidenced by the appearance of bunchy top symptoms in the treated suckers. On the other hand, the viability of the suckers was lost at 55°C to the extent of 40 per cent at 30 minutes and 60 per cent at 1 hour. There was practically no survival of suckers at 1½ hours.

Gibberellic acid injection at 1000 ppm and 2000 ppm at monthly intervals into the bunchy top affected plants resulted only in the elongation of pseudostem without any change in length and breadth of the leaves.

The new systemic fungicides viz., RH 124 or Dithane R 24 (4-n butyl-1, 2, 4-triazole) a product of Indofil chemical which is said to be effective against bunchy top disease was also not found to be effective even after six monthly sprayings at 0.1 per cent concentration. The above two experiments were conducted at Horticultural Research sub-station, Perumbarai and at the College Orchard.

R. 2. Pl. Path. 209 Studies to evolve effective field control of rhizome and pod rot of cardamon
C. V. Govindaswamy and P. Padmanaban

More reduction of rhizome and pod rot incidence i. e. 30.70 per cent and 53 per cent respectively was noticed in the clump applied with triple dose

of superphosphate and muriate of potash (510/g of superphosphate and 140/g of muriate of potash) per clump and drenched with 0.1 per cent wet ceresan at weekly intervals at Koramparai estate in Bodi area. A reduction of 16.27 anp 27.73 per cent of rhizome and pod rot incidence respectively was noticed in clumps applied with paddy husk (5/kg per clump) and drenched with 0.1 per cent wet ceresan at weekly intervals.

R. 2. Pl. Path. 210 Investigation on chilli mosaic
M. N. Alagianagalingam and K. Seetharaman

All the 41 chilli cultures artificially screened against the chilli mosaic disease were found susceptible. Among the weed plants viz., *Solanum nigrum*, *physalis minima*, *Euphorbia hirta*, *Amaranthus* sp. and *Corchorus* sp. only *S. nigrum* and *P. minima* were susceptible to the chilli mosaic disease.

R.9. Pl. Path. 201 Studies on bacterial leaf blight
N. Jaleel Ahmed and A. Venkata Rao

Evaluation of cultures for their reaction to bacterial leaf blight was conducted with 1274 cultures received from All India Co-ordinated Rice Improvement Project, Hyderabad and 51 cultures from Tamil Nadu Agricultural University, Coimbatore. Among these cultures 12 showed moderately resistant reaction. The following three cultures showed resistant reaction :— IET. 4636 (IR. 506-72-5-2-2 x BRI); IET. 5229 (Zenith x IR. 8-41) x (IR. 8 x BJI-52); IET. 5276 (IR. 8 x BJI) x SONA. In the field trial conducted with four potentially tolerant bacterial leaf blight varieties lowest incidence of the disease of 4.3 per cent was recorded on IET. 4141 and the highest incidence of 45.9 per cent on IET. 1444. The susceptible checks T(N)1 and Karuna recorded 68.5 per cent and 73.2 per cent respectively.

R.9. Pl. Path. 204 Survey of rice diseases and insect pests
N. Jaleel Ahmed and K. C. Chandy

Survey of rice crop for diseases and insect pests was carried out during the *kuruvai* season in the districts of Kanyakumari, Tirunelveli, Madurai, Tanjore and South Arcot. No disease of major importance was observed in Kanyakumari and Tirunelveli districts. Bacterial leaf blight *Xanthomonas oryzae* was widely prevalent in parts of Madurai on all the high yielding varieties grown. It was severe on Karuna. In the districts of Tanjore and South Arcot Kernel smut (*Tilletia barclayana*) was observed on Kannagi in severe form in some fields. Other varieties viz., Karuna, ADT 31 and IR 20 grown adjacent to the affected fields were found free from the disease. The brown plant hopper and leaf roller were noted as serious pests in some areas but were kept under control by chemical treatment.

R.9. Pl. Path. 206 Survey and investigations on Virus and Virus like diseases for assessing relative resistance in rice varieties
N. Jaleel Ahmed and A. Venkata Rao

No virus and virus like diseases were observed in the survey of rice areas in the districts of Kanyakumari, Tirunelveli, Madurai, Tanjore and South Arcot. A field trial for assessing the relative resistance to virus and virus like diseases was conducted with 46 varieties. There was no incidence of tungro, grassy stunt or yellow dwarf disease. The incidence of green leaf hopper and brown was negligible.

R.9. Pl. Path. 208 Studies on the incidence of brown hopper in the known varieties resistant for grassy stunt
N. Jaleel Ahmed, K. C. Chandy, A. Venkata Rao and S. Kuppuswamy

The trial was conducted with 12 varieties which included five varieties known to be resistant to brown hopper. In the periodical observations carried out the incidence of brown hopper was found to be stray.

R.18. Pl. Path. 201 Scheme for the investigation of Coconut wilt disease in Tamil Nadu
T. Jaganathan and R. Ramasami

In Thanjavur, wilt disease of coconut was high during July to October. Among the four fungicides tested viz., Dithane Z.78, Vitavax, Streptocycline and Aureofungin, least disease incidence (Disease Index 2.8) was recorded in Aureofungin sol. treated series (control Disease Index 69.0). The disease intensity was also reduced by the application of 227 g of Manganese sulphate (Disease index 1.04) or Borax (Disease index 14.37) but not by Copper sulphate, Zinc sulphate, Ammonium molybdate or Ferrous sulphate.

R.18. Pl. Path. 201 Screening the germ plasm and other breeding material for different diseases affecting cotton
T. L. Baskaran

A total number of 30 varieties were screened for resistance to bacterial blight. Only two varieties viz. IC 1024 and Reba-B-50 were found to be resistant to bacterial blight. These varieties are being utilised for evolving resistant types.

6. HORTICULTURE

R.1. Hort. 207 Improvement of tomato varieties
C. R. Muthukrishnan and R. Subbiah

One hundred and seventeen tomato types were added to the germplasm collection, thus bringing the total to 687 types. In addition, *Lycopersicon hirsutum*, *L. peruvianum*, *L. Chilense* and *L. cheesmani* were also assembled

for involving them in the breeding programme. For identification of suitable types for the rainy season, 278 types were evaluated for yield. The types L. E 4, L. E 359, L. E 268 and L. E 368 were identified as suitable for the rainy months of October to December. The yield of these types ranged from 2.0 to 2.5 kg per plant as against 1.5 kg in Co 1 and in Co 2 thus accounting for 66 per cent increase over Co 1 and 25 per cent over Co 2 tomato varieties.

The desirable segregants of *L. esculentum* x *L. pimpinellifolium* were forwarded to F_3 and a few segregants were back crossed with *L. esculentum* to improve the size. Similarly the progenies of inter varietal crosses involving Co 2, Co 1, Pusa Ruby, Annanji and SL. 120 were forwarded to F_3.

R.I. Hort. 208 Improvement of brinjal through selection and breeding
Seemanthini Ramadas and C. R. Muthukrishnan

Sixteen new accessions of brinjal were evaluated for yield and other economic characters of which the standard SM 50-A led the rest with a mean plant yield of 0.706 kg. SM. 2 continued to show its merit as a nematode tolerant type. Hybridisation work in brinjal was continued and a total of 69 successful crosses were secured in ten parent combinations. Among the 19 F_1 the combination SM. 44 x SM. 50-A was adjudged the best in respect of early yield as well as total yields recording 174.6 to 197.6 per cent increase respectively over the parents. Heterosis was noted in early yield, total yield, plant spread, number of branches, length of fruits and girth of the fruits.

R.I. Hort. 209 Nutrient and cultural requirements of vegetable crops
Seemanthini Ramadas and C. R. Muthukrishnan

Thirty five days old seedlings of brinjal are of optimum age for transplanting. They gave an increased yield of 22.0 to 37.0 per cent over seedlings which are younger or older in age. In the studies on drip irrigation in brinjal, the drip irrigated plots gave yields equal to those irrigated in the conventional system with only one fifth of the water uptake of the later. There was significant reduction in weed growth also in drip irrigated plots the reduction being 23 to 38 per cent. A preliminary study on foliage application of N in brinjal, indicated the scope for reducing the dosage of N applied to as much as 5 kg/ha as compared to soil application of the nutrient.

R.I. Hort. 210 Breeding and selection for improvement of flower quality, yield and oil content in Jasmine.
P. Veluswamy and T. Thangaraj

In a yield trial with six clones of *J. grandiflorum*, the clones Lucknow Triploid and Thimmapuram were significantly superior in yield to clone Coimbatore. The clone Lucknow recorded 3.82 kg of flower buds per plant and clone Coimbatore recorded 2.03 kg of flower buds per plant. Twelve

selections from seedlings and induced to tetraploids were forwarded for yield trial. Four selections which exhibited long corolla tube characters were utilized for crossing with mutant chosen from the irradiated population for long flower bud character. Five hybrid seedlings of induced tetraploid and natural diploid of *J. auriculatum* are under study. Seeds were obtained from 13 combinations out of 20 combinations of crosses made among the five clones of *J. grandiflorm*. Seeds were also obtained from crosses involving induced tetraploid and 8 *Jasminum* species.

R. 1. Hort 211 Improvement of agro-techniques for jasmines for high yield, flower quality and essential oil content.
S. Muthuswamy, C.M. Pappiah and T. Thangaraj

In *grandiflorum* foliar application of N depressed the flower yield while the monthly soil application round the year gave the highest yield. The additional yield per hectare by 12 monthly application works out to 2965 kg of flowers. Trial on spilt application of fertilizers on *J. auriculatum*, revealed that FYM and NPK in 6 split doses registered a per plant yield of 2.4 kg which is 20 per cent increase over two split doses.

R. 1. Hort. 216 Breeding investigations in banana.
R. S. Alagiamanavalan and C. M. Bhakthavathsalu

Among the edible diploids of *acuminata* Pisang lilin holds promise as a potential male parent. High female fertility was observed in 'Klu Teparod 'Bareli Chinia' and Govakkar that are predominantly *balbisiana* in constitution.

The hybrid 135 when evaluated was similar to the hill banana. 'Virupakshi' (AAB) in taste and flavour. In addition, this hybrid was an attractive golden yellow skin colour.

R. I. Hort 219 Introduction, selection and breeding of new papaya varieties for table purposes
L. Veerannah and R. Chittaraichelvan

A selection from Co 2 papaya (CP 35/1) has given good yield with a mean fruit weight of 3.2 kg. The pulp is thick with a TSS of 12.5 Brix. Interspecific crosses between *Carica cauliflora* and *Carica papaya* (var. Co 1 and Co 2) and intervarietal crosses were effected. The hermophrodite character of Solo papaya was observed in F_1 progenies of Co 1 and Co 2 when the solo was used as male parent. The pink flesh colour of Sun Rice Solo was dominant in F_1 of the cross Co 2 x Sun Rice Solo.

R. I. Hort. 222 Improvement of tuber crops (other than potats)
S. Thamburaj and R. Palaniswamy

The performance of ME 7 was assessed at the Research Stations and multilocational trials for yield and quality and later released as Co 1 tapioca This variety yielded 35.46 tonnes per hectare with 16 per cent increase over

other clones with a crop duration of 8½ to 9 months. It is tolerant to mosaic virus. The tubers are high in starch (35 per cent) yielding 10.33 tonnes of starch per hectare with low HCN content of 10 μg/g in flesh and 185 μg/g in the rind.

In sweet potato the clone IB 3 recorded good yield in the multilocation trials and was released as Co 1 sweet potato. This variety yielded 28.33 tonnes per hectare with 17.9 per cent increase over the local with a crop duration of 135 days. It is tolerant to root weevil infestation. The starch and total sugar content are 24.4 per cent and 9.7 per cent respectively.

In sweet potato, a clone IB 81 has been identified as a high yielding one.

R. I. Hort. 223 Nutrients and cultural requirements of tuber crops
S. Thamburaj and R. Palaniswamy

Nitrogen when applied in to split doses with 2/3 of the dose through soil at planting and 1/3 through foliage as 2 per cent urea a month after planting increased the yields of sweet potato tubers, by 37 and 12 per cent at 80 and 40 kg N per hectare respectively. The net profit per hectare was Rs. 1404 for 80 kg N and Rs. 443 for 40 kg N.

R. I. Hort. 224 Improvement of vegetable chilli (*Capsicum*) amaranthus and pumpkin
A. Rajagopal, S. Jamal Hussain, M. Kader Mohideen and V. Ashok Metha

Chillies: Comparative yield trial with the promising types of pungent chilli types during summer 1975 showed that CA (P) 247 gave an yield of 2962 kg of dry pods per hectare compared to 2476 kg for CA (P) 63 and 2305 kg for K 1. In monsoon 1975 CA (P) 247 recorded dry pod yield of 2112 kg /ha compared to 1347 kg for CA (P), 63 and 1356 kg for K 1 accounting for an increase in yield of 28.5 per cent and 55.9 per cent over K 1 for summer and monsoon seasons respectively.

The results from the multilocational trials showed that CA (P). 63 and CA (P). 247 exhibited an increased yield of 13.8 per cent and 37.5 per cent respectively over K 1.

Amaranthus: The evaluation of erect types of amaranthus in the comparative yield trials and multilocational trials showed the superiority of A 25 for green matter production. The increase in yield over Co 1 was 49 and 65 per cent on the 25 th and the 30th day respectively. In clipping types of amaranthus, five types were evaluated in which A 83 led the others with an estimated yield of 75,199 kg per hectare in a duration of 113 days followed by A 78 with an yield of 71967 kg per hectare.

Pumpkin: Studies with promising pumpkin types revealed that CM 37/9 recorded an yield of 29,373 kg/ha followed by CM 37/8 (24510 kg/ha) and Co 1 (24295 kg ha) The results from seven centres of the multilocational trials showed that 37/9 gave an increased yield of 24.4 per cent over Co 1.

R. 1. Hort. 225 Nutrient requirements and cultural practices for chilli.
A. Rajagopal, M. Kader Mohideen and S. Jamal Hussain

In the spacing-cum-fertilizer trial with three spacings of 45x30 cm, 45x45 cm and 45 x 60 cm and twelve NP combinations, the data on the yield of red riped pods showed that the closer spacing of 45 x 30 cm recorded significantly higher yield than the other spacings. Among the fertilizer combinations N 150 P 60 kg/ha at the closer spacings registered an yield of 6070 kg/ha which was on par with N 150 P O kg/ha (5177 kg), N 100 P 120 Kg/ha (4958 kg), N 50, P 120 kg/ha (4565 kg) and N 50 P O kg/ha (4654 kg per hectare.

R. 1. Hort. 226: Effect of Ethrel and pruning on the productivity of mango
V. N. Madhava Rao and K. G. Shanmugavelu

Two Mulgoa trees and Baneshan tree were subjected to pruning and Ethrel treatment as per schedule. In Baneshan, the treatment with pruning and Ethrel at 200 ppm plus pruning yielded the highest crop of 210 fruits weighing 55.20 kg and 195 fruits weighing 53.50 kg respectively as against 85 fruits with 21.00 kg in the control. Two Mulgoa trees gave an average yield of 927 fruits weighing 249.47 kg in 1975.

R. 1. Hort. 232 Varietal improvement in grapes
K.G. Shanmugavelu and P. Selvaraj

The varieties Black Champa, Oval while, Convent Large Black and Hussaini continued to record high yields. The variety Black Champa recorded ded the highest yield viz., 9.100 kg/ ha vine followed by Oval white (8.900 kg/vine) Convent Large Black (6.00 kg/vine) and Hussaini (4.100 kg/vine). The commercial variety Muscat Hamburg recorded only 3.300 kg yield/vine while the Anab-E. Shahi did not come to bearing at all.

R.1, Hort. 236 Mutation breeding in tomato and brinjal
C. R. Muthukrishnan, R. Subbian and Seemanthini Ramadas

Among the six mutants forwarded for further testing, the mutant I.M39 was determinate in character with compact plant type and shorter duration of 110 days, yielding 1.5 to 2.0 kg per plant. The fruits are medium sized and globular in shape. The desirable plant characters have offered scope for increasing the plant density by 33 per cent and gives an yield of 43 tonnes per hectare. The mutant IM. 69 is a determinate type with compact plant stature and a duration of 115 days yielding 1.3 to 1.5 Kg per plant. The fruits are bigger with flat shape. This mutant also offers similar scope of increasing the population

by 33 per cent and gives a hectare yield of 37 tonnes. Another mutant IM. 3 is spreading in habit, with the duration of 120 days yiedling 2.0 to 2.5 kg per plant and found suitable to grow with normal spacing. The fruit is medium with globular shape and it yields 43 tonnes per hectare.

R.1. Hort. 237 Improvement of bhendi through selection and breeding
R. Arumugam and C. R. Muthukrishnan

Six new accessions were added during the year bringing the total to 180 under bendi. Among the new accessions AE 180 out yielded Pusa Sawani by 18 per cent in the yield trial. The fruits are long study and green in colour. The selection AE 106 isolated from 'Red Wonder' was tested under multilocational trial and released as Co 1 bhendi. The plants of AE 106 are moderately vigorous and tolerant to yellow vein mosaic. The shoots, petiole, midrib and basal veins of the lower surface of the lamina are prominently scarlet red in colour. The pods are long, slender, fleshy, smooth and scarlet red in colour. They are less in crude fibre content (14.06 per cent) and rich in starch (14.80 per cent) and protein (18.08 per cent). AE 106 has registered an average yield 14 t/ha with an increase of 8 per cent over Pusa Sawani.

R.1. Hort. 240 Improvement of cucurbitaceous vegetables through selection and mutation breeding
S. Sundararajan and C. R. Muthukrishnan

A high yielding medium duration culture TA 2-6-1 suitable for monsoon and summer seasons in all parts of Tamil Nadu was released as Co 1 snakegourd during the year. This variety is shorter in duration by 30 days as compared to local varieties with 165 days. The plant is medium spreading· accommodating 6000 plants per hectare at the rate of three plants per pit, The fruits are green with white stripes. The fruits come to harvest in 70 days. The average length of the fruit is 180 cm weighing 500 to 750 g each. It yields 18,284 kg/ha with a ten per cent increase over the local. The culture L. A. 3-2-1 was released as Co 1 ribbed gourd. This variety gives 25 per cent increased yield within 125 days while the local varieties require 150 days. It is suitable for January and July sowing. This variety flowers in 35 to 40 days after sowing and the fruits are available for harvest in 50 to 60 days. Each fruit weighs 300-350 g with 60-75 cm in length· The mean yield per hectare is 14,139 kg. Besides these, one short duration variety of ribbed gourd with a duration 90 days and a mean hectare yield of 11,200 kg has been identified. Similarly two short snakegourd types have been identified with high yield (15,000-16,000 kg/hectare) and crop duration of 95 days.

In mutation breeding, two promising mutants in each of bittergourd and ribbed gourd and one selection in snakegourd have been advanced, for yield trials.

R.I. Hort. **243** **Improvement of radish in Tamil Nadu**
R. Arumugam and C. R. Muthukrishnan

The selection RS 13 an early type of 45 days duration was advanced for multilocation trial. In the yield trial with six varieties, R S 13 recorded 15.5 t/ha with 13.6 per cent increased yield over Pusa Rashmi.

R.I. Hort. **245** Co-ordinated varietal testing in vegetable crops
A. Rajagopal, S. Jamal Hussain, A. Ashok Metha and M. Kadermohideen

Co-ordinated varietal testing has been taken up with 10 varieties in tomato, 13 varieties in long fruited brinjal, seven varieties in round fruited brinjal, 18 varieties in chilli, seven varieties in onion, three varieties in pumpkin and two varieties in bottle gourd. Among the medium and large fruited varieties of tomato, S1. 120 gave 26,949 kg/ha recording 132 per cent over Co 1. In long fruited brinjal varieties, S4 gave a fruit yield of 25955 kg/ha closely followed by Pusa Purple Long (25,772 kg/ha) with reference to round fruited varieties, Punjab Hybrid was higher yielding with an yield of 13,000 kg/ha. Local striped ranked second with an yield of 9169 kg/ha. Among the chilli varieties CA(P) 247 recorded an yield of 8447 kg/ha followed by Madurai 4, K2, K1 and CA(P) 63 with the yields of 5563 kg, 5553 kg, 5417 kg and 5388 kg/ha respectively. Among the seven varieties of onion, N 53 recorded an increased yield of 32.7 per cent over Local Bellary followed by Pusa Red (16.8 per cent). Co 2 pumpkin recorded an yield of 55,072 kg/ha.

In bottle gourd Jorhat Selection No. 6 registered an yield of 26,571 kg/ha as compared to the yield of 13,276 kg/ha recorded by local.

R.I. Hort. 247 Selection and breeding for improvement of quality yield and essential oil content in roses
I. Irulappan and V. N. Madhava Rao

One hybrid seedling in the combination "Spartan" x "Edward" reached flowering stage and the flowers resembled the colour of Spartan but inherited the fragrance of Edward. The flowers also possesssd a keeping quality of 48 hours as against the very poor keeping quality of Edward. The hybrids are under evaluation for further economic triats. Two more hybrid seedlings in the combination "Edward x Kiss of Fire" are in pre-flowering phase.

R.I. Hort. 249 Evaluation of different species and varieties of jasmine for essential oil
S. Muthuswamy

The recovery of concrete from the high yielding *J. grandiflorum* clones, viz. Lucknow, Triploid and Thimmapuram was 0.27 per cent while in the clone Coimbatore, the recovery of concrete was 0.30 per cent. A survey of market acceptance of the concrete of *J. grandiflorum* indicated the possibility of securing a price of Rs. 7000 per kg.

R.I. Hort. 251 **Improvement of agro-techniques for roses**
I. Irulappan

In a trial to determine the best time and method of pruning Edward rose, yield data indicated that pruning in the month of October increased the yield by 36.6 per cent over control. A comparison between hard and medium pruning indicated an increased yield of 4 per cent over hard pruning. In the trial to compare the efficacy of horse manure and cattle manure, the application of cattle manure at 100 g N per plant recorded 33 per cent more yield than 100 g N of horse manure.

R.1. Hort. 259 Economics of essential oil production in Pari Mullai
S. Muthuswamy and T. Thangaraj

Economics of fresh flower production and concrete production were evaluated. The cost of cultivation for fresh flower production was Rs. 24,700/-ha and the cultivation and extraction of concrete was Rs. 68,345/ha. The net income was Rs. 14,252/ha from fresh flower production and Rs. 83,560/ha from concrete production.

R. 1. Hort. 260 Economics of essential oil production in jathi malli.
S. Muthuswamy

Economics of fresh flower production and concrete production were evaluated. The cost of cultivation for fresh flower production was Rs. 29,740/ha and the cost of cultivation and extraction of concrete was Rs. 1,12,240/ha. The net income was Rs. 35,075/ha for fresh flower production and Rs. 71,530/ha for concrete production.

R. 1. Hort. 263 Improvement of *nerium*
P. Rangaswamy

Three cultivars of *nerium odorum* viz. white, pink double and pink single were planted in the field. Spraying of 500 ppm of CCC has induced flowering in 125 days as against the 180 days taken for flowering by untreated plants.

R. 1. Hort. 265 Study of Hibiscus hybrids and cultivars
V. Sampath and P. Veluswamy

Forty plants of 28 cultivars and 2 species of *Hibiscus* were planted in the field. Inter generic crosses between *Hibiscus rosa sinensis* (orange single) and *Malvaviscus arboreus* (Blood red single) resulted in Four F_1 plants. Inter specific crosses between *H. rosa sinensis* (orange single) and *H. schizo petalus* (red) yielded 27 F_1 plants. In inter varietal crosses involving *H. rosa sinensis* orange single and red double 18 F_1 plants were obtained.

Of the above, two intervarietal hybrids, one inter-generic hybrid and all inter specific hybrids have been identified as promising with reference to colour, vigour of the plant and double nature of petals.

R. 1. Hort. 270 Breeding for multiple resistance to pests and diseases and for heat tolerance in tomato

C. R. Muthukrishnan, R. Subbiah, C. R. Gunasekaran, S. Chelliah, Lakshmi Ramakrishnan, R. Ayyavoo and V. Sivakumar

Fifty tomato types were screened for *Fusarium* wilt, leaf spot, virus diseases and nematodes. LE 518, 544, 571 and 612 are resistant to Fusarium wilt and the types LE 618 and 632 are moderately resistant to leaf spot disease. LE 545 is moderately resistant to both leaf spot and Fusarium wilt. LE 625 and 629 and 113 are resistant to root knot nematode and LE 629 to reniform nematode. None of the tomato types tested were resistant to virus diseases.

To identify types for summer season, 270 types were evaluated during February, March, April and May, when the maximum temperature ranged from 32°C to 36°C with relative humidity of 80 per cent. The cultures LE 573 and LE 574 were tolerant to high temperature and yield 2.5 to 3.0 kg per plant compared to 1.5 kg per plant in Co 1 tomato and 2.0 kg plant in Co 2 tomato.

R. I. Hort. 271 Breeding for multiple resistant to pests and diseases in bhendi

C. R. Muthukrishnan, R. Arumugam, C. R. Gunasekaran, S. Chelliah, Lakshmi Ramakrishnan and V. Sivakumar

Thirty accessions of bhendi were screened against yellow vein mosaic, powdery mildew, fruit and shoot borer, aphids, mites and nematodes under controlled condition. The culture AE 138 recorded a low incidence of yellow vein mosaic and powdery mildew while all the 30 accessions were found to be snsceptible to fruit and shoot borer and root knot nematode (*Meloidogyne incognita*).

R. I. Hort. 273 Collection of germplasm, evaluation and maintenance of coriander

R. Arumugam

Under germplasm, 251 types were evaluated of which CS 553 and CS 558 recorded 11 and 23 per cent higher yield than Co 1 during monsoon and winter seasons respectively. In the varietal trial with eleven varieties, MS 1 and MS 3 were earlier in flowering by 12 days than Co 1.

R. 1. Hort. 274 Collection of germplasm evaluation and maintenance of fenugreek

R. Arumugam

Three selections viz., CS 381, CS 1084 and Cs 2336 recorded higher yield of 6 to 13 per cent than the local during the year. They were advanced to yield trial.

R. I. Hort. 281 Improvement of onion
K. P. Palaniswamy and I. R. Sudhanthira Pandian

Nineteen *aggregatum* onion types were selected from the germplasm collection and were tested under progeny row trial. Among them, during the summer season, CS 527 recorded 67.0 per cent higher yield over Co 2 onion followed by CS 522-C1-2-16 (66.4 per cent) while in the winter season CS 672-C1-4 recorded 71.0 per cent higher yield over Co 2 onion. The type CS 450-C1-4 pink was found suitable for both the seasons recording 55.3 per cent and 61.6 per cent higher yields over Co 2 onion during summer and winter seasons respectively.

R. I. Hort. 282 Varietal evaluation and development of suitable varieties of cabbage for the plains
K. G. Shanmugavelu and S. Anbu

The varieties Early Solid Drum Head, Large Early Solid Drum Head, Pride of India and Golden Acre when transplanted in August and September, 1975 were the earliest, with the duration of 92 days. The duration of the remaining varieties ranged from 98-121 days. In respect of yield, large Early Drum Head recorded the highest mean weight of 830 g/head followed by Late Solid Drum Head (710 g) and Red Drum Head (680 g).

R. I. Hort. 286 Varietal evaluation and development of suitable varieties of carrot for the plains
K. G. Shanmugavelu and S. Anbu

In the varietal trials, the variety Half Long Donwas recorded the highest yield of 147.50 g/plant followed by Pusa Kesar and Chantaney which recorded 142.5 g and 141.0 g/plant respectively indicating their suitability for September sowing in plains.

R. I. Hort. 287 Varietal evaluation and development of suitable varieties of beans
K. G. Shanmugavelu and P. Chockalingam

Seeds of 43 varieties of French beans were sown during September-October 1975. The varieties Contender, Premier, Bangalore Local, Kentucky Wonder, Striped Bountiful, Bugh Bean, Nepali Local, Early Stringless, Long Poded Negro, Master Piece, Canadian Red, Bountiful, Dwarf Block, Broad Long Pod and Painted Lady were ready for harvest in 50-52 days. In respect of yield, the variety Dwarf Black recorded the highest yield of (181.3 g/plant followed by Kentucky Wonder (149.1 g) Rekord (148.5 g) and Early Market (137.0 g).

R. 6 Hort. 206: Manurial trial in guava.
J. B. M. Md. Abdul Kader and D. Sathiamoorthy

The maximum yield of 26 kg of fruits was obtained from the trees receiving 250, 200 and 200 gm of N, P and K respectively as against 6.5 kg recorded by the control trees.

R. 6 Hort. 208 **Manurial trial in banana**
O. Anchanam Alagia Pillai and D. Sathiamoorthy

In 1975 crop, the treatment 200 kg N, 40 Kg P and kg K/ha recorded the maximum yield of 7.6 kg/plant (9120 kg/ha)

R. 6 Hort. 209 Introduction and study of new kinds and varieties of fruits
J. B. M. Md. Abdul Kader

The atemoya selection proved to be of worthy addition to the fruit wealth of the State as it bears fruits of excellent quality comparable to eheri-moyer.

R. 6 Hort. 211: Evolution of suitable Varieties and agronomic practices in chillies
O. Anchanam Alagia Pillai and D. Sathiyamoothy

In the manurial trial, 90 kg N/ha recorded the maximum yield of 10,444 kg/ha(wet weight) as against 6,444 kg/ha (wet weight) recorded by 30 kg N.

R. 6. Hort. 212: Study of varietal performance of beet-root, cabbage and radish
O. Anchanam Alagia Pillai, S. Balasubramanian

Pusa Rashmi variety of radish yielded 37,750 Kg of tubers/ha as against 26,683 kg recorded by Contai Short grown as the control. In beet-root the highest /ha yield of 48,900 kg was recorded by the variety Red Ball, while it was 28,350 kg in Detroit Dark Red.

R. 7. Hort. 216 Improvement of tapioca and sweet potato throug introcuction and selection
O. Anchanam Alagia Pillai and R. Jeyapal

In a varietal performance study of tapioca, the maximum yield of 48.8 t /ha was recorded by H.I. while Malavelia, the ruliug variety yielded 33.3 t/ha, giving an additional income of Rs 4,500/-

R. 7 Hort. 201: Improvement of apples through introduction and selection.
D. Paulas and Peter G.B. Vedamuthu

From the collection of 120 varieties, a clonal selection of parlin's Beauty (Kodaikanal) which is a midseason variety recorded the highest yield of 500 fruits in the tenth year of planting of which 352 fruits (40 kg) carried to maturity. In terms of value it works out to Rs. 160/ per tree. The quality was good recording a TSS of 13 to 16 percent and acidity 0.33 per cent. The ascorbic acid content was 13 to 16 mg per 100 g.

R. 7 Hort. 204: Effect of 'Alar' in promoting yield of apples.
D. Paulas and Peter G.B. Vedamuthu

Among the six concentrations of Alar (1000 to 6000 ppm) the highest fruitset was 123.5 fruits recorded by spraying Alar 2000 ppm while the unsprayed control recorded the lowest set of 34.0 fruits. Spraying Sandolin 'A' 0.5 per cent to break the dormancy gave mean fruitset of 51.0 fruits indicating the efficiency of the chemical.

R. 7 Hort. 208 Studies on the combined effect of Sandolin 'A' +Gibberellic acid 500 ppm+Alar 2000 ppm on Parlin's Beauty
D. Paulas and Peter G.B. Vedamuthu

The combination spray of Sandolin 'A' 0.5 per cent, Alar 2000 ppm and Gibberellic Acid 500 ppm 40 days after fruitset on Parlin,s Beauty recorded the highest yield of 201 fruits weighing 26.200 kg while the yields were the lowest in the unsprayed control (93 fruits weighing 11.150 kg). The additional income/tree was Rs. 60/-over control. The fruit size was also increased recording a mean weight of 130 g as against 120 g control. There was however, no difference in the quality of fruits.

R. 7 Hort. 213 Studies on the propagation of geranium and mint,
K. R. Raman and P. Vasudeven

Among the three types of cuttings in geranium viz., basal middle and terminal, the terminal cuttings recorded the highest percentage of success of 90.0 percent followed by 89.0 percent in middle and 66.0 percent in the basal cuttings. Planting the cuttings in polythene tubes not only recorded higher success but also resulted in larger number and longer roots which facilitate easy establishment.

Among the three species of Mentha viz., *Mentha piperita M. citrata* and *M. spicata* the cuttings *M. citrata* recorded 74. 0 per cent rooting followed by 55. 6 per cent in *M. spicata* and 54.7 per cent in *M. piperita* in polythene tubes. The cutings planted in beds however recorded 62 per cent in *M. citrata* and 47 per cent success each in *M. spicata* and *M. piperita* indicating that polythene tubes can be advantageously used for obtaining better rooting of mint cuttings.

R. 7 Hort. 216 Varietal cum fertiliser trial in pyrethrum.
K. R. Raman and P. Vasudevan

Pyrethrum commenced flowering in four months after planting of seedlings and continued to produce flowers during all the 12 months. Fourteen single plant selections, which yielded over 500 flowers each were made.

Application of 120 kg of P/ha in combination with 20 kg N and 20 kg K gave the highest yield of 33 lakh flowers/ha (450 kg on dry weight basis)

as against 370 kg with dosage of 40 and 80 kg P/ha. The size of flowers (59.2 g per 100 flowers) was also the highest in the highest dose of P than the lower levels (51 per 100 flowers). The pyrethrin content was more (1.046 per cent) in January compared to other months (0.85 to 1. 014 per cent) The ratio of Pyrethrin ranged from I: 0.708 to I: 0. 931.

R. 7 Hort. 220 Effect of time of planting and spacing on yield of herbage and oil of *Mentha*
K. R. Raman and P. Vasudevan

The trial on the optimum time of planting for the three species on *Mentha* viz. *M. citrata M. spicata* and *M. piperita* revealed that the establishment of *M. cittata* was better in all the dates of planting viz. end of June middle of July and end of July, while *M. spicata, M. piperita* were slow to establish. The closer spacing of 40 x 40 cm in *M. citrata* gave the highest yield of 13,000 kg/ha in November (in four months of planting) The oil content of leaves of *M. citrata* collected in August was more (0.358 per cent) than the other months. *M. piperita* and *M. spicata* yielded 0.27 and 0.22 per cent oil respectively.

R. 7 Hort. 221 Evaluation of geranium at different stages of growth and seasons.
B. Habibullah and R. R. Raman

The month of August was found to be the best time for oil extraction yielding an oil recovery of 0. 132 per cent while it was the lowest in September yielding 0.092 per cent from the terminal shoots. The terminal shoots recorded the highest recovery (0.132 per cent) compared to the middle 0.068 per cent) and basal cuttings (0.054 per cent) The quality of oil was best during January registering a total alcohol per cent of 60.26 and specific gravity 0.9006.

R. 7 Hort. 223 Evaluation of different medicinal and aromatic plants growing in Kodaikanal
B. Habibullah and P. vasudevan

Datura stramonium recorded an alkaloid content of 0.546 per cent and *Lobelia excelsa* 0.418 per cent *Artemisia vulgaris* registered an oil content of 0.275 per cent in August and November while it was 0.215 per cent in March *Santalina* yielded 0.253 per cent oil.

R. 8 Hort. 202 Evolution of suitable varieties of cabbage, beans and cauliflower during winter season
N. Raghavan

Among the three varieties of cabbage, Golden Head ranked first yielding 6316 kg/ha. This is earliest and has a duration of 67 days.

R. 8 Hort. 203 Studies on tuber crops including potato tapioca and sweet potato for obtaining maximum yield
N. Raghavan

Of the twelve types of tapioca cultures and varieties tested for their yielding ability, variety H. 97 ranked first yielding 28,404 kg/ha.

R. 12 Hort. 201 Maintenance and study of 'Gene-Bank'
V. Rajan Henry

Among ths exotic diploids of monospecific origin (AA), the clone 'Pisang lilin' came to harvest within 225 days. The bunch weighed on an average 6 kg with 5 hands containing 64 fruits with a mean length of 19 cm and mid circumference of 7.3 cm. The male flowers were highly polleniferous and crosses were made using it as male with other indigenous and exotic diploids and triploids. The were medium tall and fairly resistant to leaf-spot. ("High-gate AAA") a semi tall mutant of Gros Michel gave a bunch with a mean wieght of 12.5 kg having 6 hands containing 67 fingers each with a mean length of 27 cm and girth of 13 cm. This was the longest fruit among various clones assembled in the 'Gene-Bank'. Leaf spot disease was moderate. During May, 1975 "dichotamous" mutant of Poovan was introduced and it was observed that the dichotomy wes exhibited in diferent phases of growth. In one of the suckers, two separate growing points were seen within a single pseudostem which in the othe rthe dichotamy was seen after the development of second hand giving out two different peduncle, hand and male buds.

R. 14 Hort. 202 Progeny trials in cashew
M. Kulasekaran and A. Shahul Hameed

Out of the progenies planted in 1966, only three progenies produced fruits during this year, while all the six progenies of 1970 planting produced fruits. The earlier findings of superiority of K. 20/5 was found this year also, by giving a yield of 4.700 kg/tree.

R. 14 Hort. 203: Comparative preformance of clones and seedlings
M. Kulasekaran

This experiment was laid out in the year 1970, with two treatments viz., inarches and seedlings of cashew. Inarches and seedlings of some parentage were planted. During this year, out of 96 experimental plants (48 inarches and 48 seedlings) only 12 produced nuts (six inarches and six seedlings) Among clones versus seedlings, seedlings parentage produced more nuts (3.300 kg) than incarches (2.400 kg) per tree.

R. 14 Hort. 206 Hormonal application to increase the fruitset In cashew
M. Kulasekaran and A. Shahui Hamed

The highest yield of 2.600 kg of nuts per tree was obtained in 2,4-D at 10 pm sprayed trees which was closely followed by IAA 100 ppm (2.250 kg)

and 2,4-D 5 ppm (1.400 kg) of nuts per tree, where as control was 1.050 kg. Foliar application of 2,4-D (10 ppm) spray increased the fruitset and 66 per cent more yield than untreated plants The 2,4-D (10 ppm) spraying gave an increased yield in cashew with additional profits of Rs.1042/ha over untreated tree.

R. 14. Hort. 207 Comparative cashew yield trial with existing high yielders under different agroclimatic regions
M. Kulasekaran and A. Shahul Hameed

Four types of cashew from Vengurla, Bapatla, Vriddhachalam and Anakkayam centres were under yield trial. Among them Bapatla was noted for early yielder and produced 25 fruits/tree.

R. 14. Hort. 212 Trials on control of stem borer on cashew
A. Shahul Hameed and M. Kulasekaran

The trials on the control of stem borer on cashew were conducted. The earlier finding was confirmed that Fenitrothion (Sumithion) at 1% was effective in controlling the stem borer.

R. 17. Hort. 101 Evaluation of germplasm of *Capsicum* under irrigated conditions
P. Rangaswamy and A. Thiruvengadam

Among 76 types established under germplasm collections, the types have recorded higher yield than K. I chilli on single plant basis, the higher yield ranging from 1.06% to 103. 77%.

R. 17. Hort. 201 Breeding of chillies varieties superior to K 1
P. Rangaswamy and A. Thiruvengadam

Twenty nine parental combinations involved in breeding to produce a variety superior to K. 1 in earliness, prolific bearing, better fruit characters, short stature and more pungency proved unsuccessful in F_1 and F_2 generations. The progenies obtained by crossing 1407 x 1395 had recorded in F_3 generation a higher yield ranging from 0.98 to 104.21% over standard K. 1 variety on dry weight basis. In F_4 generation the progenies of the cross between 1447 x K 1 have recorded a higher yield ranging from 2.80% to 136.68%.

R. 17. Hort. 202 Performance of types or strains of chillies
P. Rangaswamy and A. Thiruvengadam

One type of chilli-Kalyanpur Pili had recorded a higher yield of 30.85% over standard K 1 strain. All the other types recorded lower yield than K 1 during the year.

R. 19. Hort. 202 Varietal evaluation in tomato, brinjal, *bhendi*, amaranthus and cowpea
R. Sambandamurthi

Tomato

The randomised trial with 14 varieties of tomato was concluded. The mutants IM 69 and IM 39 were found to be superior in recording higher yield of 8056 kg and 7849 kg of fruits/ha respectively. The varieties Co 1, Co 2 and *Pusa Ruby*, *Sioux* and IM 3 were also on par with the mutants IM 69 and IM 39 in yield performance. In general the yield of tomato fruits in all the varieties tried was poor due to the extreme drought conditions that prevailed during the season.

In another trial with ten varieties of tomatoes planted during September 1975 the yield data indicated that the varieties Co. 1, Co. 2 *Pusa Early Dwarf* and the mutants IM 3 and IM 69 were all on par with each other in yield. The yield ranged from 8080 kg to 10,305 kg tomato fruits/ha.

Brinjal

A randomised trial with the following five varieties SM 50 A, SM 2, *Thenguthittu*, *Annamalai* and *Pusa Pueple Long* was concluded during July 1975.

The yield data indicated that the variety SM 50 A was significantly superior in yield with 32622 kg/ha. The varieties *Annamalai* and *Pusa Purple Long* were on par with each other with 27955 kg/ha and 25573 kg/ha. The local veriety *Thenguthittu* has recorded the lowest yield of 10,960 kg/ha.

Bhendi

A trial with 9 varietias planted during July '75 was concluded. The yield data indicated that the variety *Gumbo* was significantly superior in yield with 10,666 kg fruits/ha, closely followed by the variety *Shankarpalli* with an yield of 9222 kg fruits/ha.

R. 20. Hort. 201. Studies on control of bunchy top disease of banana,
M. Kulasekaran and G. Paranjothi

A survey of the prevalence of bunchy top indicated that the Red Banana is the most susceptible followed by Virupakshi. In the AB clone Neypoovan and and Monthan, the incidence of disease was less. Diseased banana suckers of the Virupakshi variety were subjected to hot air treatment at 50°C for 1, 2 and 3 hours and planted at Horticultural Research Sub-Station, Thadiyankudisai and also in a private plantation. The observations indicated that the leaves emerged showed the virus sumptoms and also there was difficulty in the establishment of suckers. The data gathered for determining the frequenty of spraying Rogor (0.03%) on the control of bunchytop disease showed that the incidence of diseased plants (mean number) per plot was 5.3 for 15 days, 7.3 for 30 days

and 6.0 for 60 days interval, whereas the mean number of affected plants was 7.8 in the case of control.

R. 20. Hort. 202 Investigation on Vegetables
M. Kulvsekaran and G. Paranjothi

In a spacing trial with French beans under rainfed condition, the data showed that very close spacing of 15 cm x 15 cm gave maximum plot (12 sq. metre) yield of 421 g of shelled beans.

8. FORESTRY

R. 1. Forestry 203 Studies on production technique of bamboo rhizome propagule *(Dendrocalamus strictus* and *Bambosa arundinacea* syn. *B. bambos*)
P. Seshadri

The differential behaviour as regards regeneration, are investigated. The tentative conclusions that could be drawn are : i) cutting a chain reduces its overall regenerative capacity, ii) if cutting is done, it appears, longer the chain in terms of number of generations, (reckoning from the distal and i. e., the most recent generation) the better, it is, from the point of regenerative ability.

R. 1. Forestry 204 Studies on exploring the possibilities of raising woodlots of energy fuel and industrial raw materials in private/ corporate holdings
P. Seshadri and S. Kondas

At Bhavanisagar, the differential performance of the species as regards survivability under poor rainfall conditions indicated that *Acacia planifryos* was the best (94.6 per cent)

R. 1. Forestry 205 Evolution of efficient, convenient and economical nursery stock of *Eucalyptus* species

The two species *E. citriodora* and *E. hybrid* are under experimentation. Two months old *E. hybrid* seedlings were packed into polythene containers and the establishment has been good (over 80%), seeds of *citriodora* were sown directly into containers and the germination has been uniform in all the container sizes.

R. I. Forestry 207 Evolution of efficient, convenient and economical nursery stock species
R. Jambulingam and K. L. Chella Pillai

The aim is to evolve a method by which a stock capable of good establishment and possessing a well developed short and root system within the shortest possible duration.

The work is confined to *Tamarindus indica, Albizzia lebbek, Ailanthus excelsa* and *Holoptelia Integrifolia* and to different polythene container

sizes. Seeds collected from single trees of *Holoptelia integrifolia* and *Ailanthus excelsa* showed very poor germination. (10% and 3% respectively) *Tamarindus indica* and *Albizzia lebbek* have shown very good germination (80%) in all the container sizes.

8. SEED TECHNOLOGY

R. I Seed Tech. 202 Evolving suitable techniques for the production, processing and storing of of parental and hybrid seeds of bajra and maize
K. R. Ramasamy and C. Ramalingam

To determine the optimum dates of sowing of the parental lines viz., 23 D_2A and PT 1921 of UCH 1 cumbu hybrid for maximum recovery of quality seeds, a trail was laid in three locations. It was observed that in the case of simultaneous sowing, the male parent flowered 3 days earlier than the female whereas in the 4th and 8th day sowings, flowering of the male was simultaneous and 2 days later, respectively. The flowering of the female parent was uniform in all the locations. A maximum hybrid seed yield of 1187.7 kg/ha was recorded in the plots where the male parent was sown 4 days later than the female in the ratio of 4:2.

R. I seed Tech. 203 Studies on standardization of seed production techniques in Tomato
K.K. Vadivelu

The results indicated that size of the fruit was positively associated with seed recovery and seed quality. A study carried out with the seeds obtained from Co. 1 fruits harvested at three rippening stages viz., (i) fully developed and matured fruits with yellow skin colour; (ii) fully matured and half ripened fruits with yellowish red skin colour and (iii) fully matured and ripened fruits with red skin colour and subesquently size graded into 5 sizes viz.. 4.0 x 3.5; 3.5 x 2.5; 3.0 x 2.5; 2.5 x 2.5 and 1.5 x 2.0 cm, revealed that size of frults. irrespective of the ripening stages significantly influenced the germination and vigour of the seedlings. Significant differences were not observed in seed quality due to harvesting stagds. A comparative study of seed extraction methods viz,, (i) fermentation, (ii) acid treatment; (iii) Alkali treatment and (iv) separation by tomato pulper indicated that seed separation by acid treatment method was superior to others as measured by recovery and germination percentage, 100-seed weight and seedling growth.

A trial consisted of six spacings viz., 75 x 65 (S1); 75 x 80 (S2); 75 x 95 (S3); 100 x 65 (S4); 100 x 80 (S5) and 100 x 95 (S6) cm and three levels of fertiliser application viz., 75:100:50 (M1); 100:100:100 (M2); and 150:100.150 (M3) of N:P:K kg/ha was conducted to determine the optimum spacing and fertillizer requirements for the production of quality seeds in Co 2 tomato, The results of the trial were (i) significant differences were not

observed in pickingwise seed yields either due to spacings of fertilizers or due to interaction of both; (ii) The recovery percentage of seed to the total fruit weight ranged between 0.8 and 0.9 among the treatments; (iii) The recovery of quality seeds was found to decrease after the sixth picking. The range of recovery for the first six pickings being 75-85 per cent with a mean of 83.9 per cent and for the 7th to 10th picking being 50–35 per cent with a mean of 37.8 percent; (iv) Maximum seed yield of 198 kg/ha (Ungraded) was recorded in S1 x M3 closely followed by S2 x M2 (188 kg/ha) and S1 x M2 (185 kg/ha).

R.1. Seed Tech. 204 Standardisation of seed production techniques in brinjal (*Solanum melongena*)
G. Thulasidas and A. Jacqueline Selvaraj

A field trial involving two varieties viz., SM 50 and SM 2; three spacings viz., 75 cm x 75 cm (S1), 75 cm x 60 cm (S2) and 60 cm x 60 cm (S3) and three major nutrient combinations viz., 100 : 25 : 25 (M1), 150 : 50 : 50 (M2), 200 : 75 : 75 (M3) of NPK in kg/ha conducted revealed that in the variety SM 50, (i) the seed yield differences due to pickings were not significant either due to spacing or due to nutrients or due to interaction of both; (ii) the mean seed recovery percentage was from 4.7 to 5.0 among the pickings; (iii) A maximum seed yield of 150.24 kg/ha was recorded in the S1 x M3 treatment and the minimum of 51.11 kg in S2 x M3; (iv) the mean germination of seed immediately after harvest was 70 per cent and (v) the quality of the seed got improved by sieving through 10 x 10 and 12 x 12 sieves. The response of the other variety to spacings and fertilizer combinations was not significant.

R.1. Seed Tech. 205 Evolving suitable package of practices for quality seed production in Okra (*Abelmoschus esculentus Moench*)
C. Ramalingam

Bulk seeds of variety 'Pusa Sawani' was size graded using sieves of size 10"/64, 11"/64 and 12"/64 with round holes. The percentage of recovery of seeds were 31, 42 and 21 respectively. The seeds in each grade were separated into three colour categories viz., green, olive green and black, the mean proportion of which worked out to 11 per cent, 43 per cent and 46 per cent respectively. No association was observed between size or colour and germination under laboratory conditions.

R.1. Seed Tech. 206 Studies on the package of practices for quality seed production in *cucurbits* and *onion*
K. R. Ramaswamy, C. Ramalingam and K. Nagarajan

Bulbs of Co 2 onion were size graded using the sieves of 40"/64, 28"/64, 26"/64, 24"/64 and 22"/64 size with round holes. A maximum recovery of 61.8 per cent was from the sieve size 28"/64 retained followed by 9.38 per cent in 24"/64, 9.28 per cent in 26"/64, retained and 7.83 per cent in 22"/64 passed, 5.99 per cent in 40"/64 and 5.7 per cent in 22"/64

retained. The mean weight of 1000 bulbs ranged from 2378 g in 40"/64 retained to 333 g in 22"/64 passed.

A maximum mean number of 8.15 bulbs per plant was recorded in plants planted with 40"/64 retained grade bulbs, while in other grades the mean number gradually reduced with decrease in bulb size. The yield of bulbs among the grades was significant. A calculated hectare yield of 8866 kg in 28"/64 retained and 8434 kg in 40"/64 grades were recorded while in others there was gradual decline in yield with decrease in size of bulb.

In another trial bulbs of Co 2 onion retained in 28"/64 sieve was subjected to prosoaking treatments. The bulbs were given 3 cycles of distilled water treatment, both dipping and immersion, and dried to original moisture level. It was found that there was no significant difference in yield and other characters due to treatments. However, single cycle of root dipping has given an increased yield of 19.3 per cent (11,725 kg/ha) over control (9834 kg/ha) followed by 14.5 per cent (11,261 kg/ha) in 2 cycles root dipping, 5.9 per cent (10,412 kg/ha) in 3 cycles root dipping and 3.8 per cent (10,207 kg/ha) in two cycles water soaking.

In Bitter gourd seed size was found to be positively associated with vigour of the seedlings. No relationship was observed between number of mature seeds and size of fruit.

In Snakegourd, full maturity of seeds takes place in about 50 days after pollination and only about 34 per cent of matured seeds germinate immediately after extraction, while the rest remained as hard seeds. The occurrence of hard seeds was more in middle (34 per cent) and basal (41 per cent) regions than in the distal region (31 per cent).

In ribbed gourd, an analysis fruits of varying length indicated no association between length of fruits and number of matured seeds.

In Ashgourd, presence of dormancy was evident from 25 per cent germination recorded by the matured seeds extracted from 135 days old fully matured fruits. Seed recovery, 1000 seed weight and kernel weight were more from seeds extracted from middle region of the fruits than from the distal and stylar regions. In Pumpkin, the per eent of matured seed was 18.8, 59.9 and 16.7 respectively from the basal, middle and distal regions of the fruits.

R.1. Seed Tech. 208 Studies on seed production technology in red gram
V. Ramakrishnan, T. V. Karivaratharaju and
K. K. Vadivelu

The trial conducted to study the influence of application of different levels of [NPK straight fertilizers (N : 0, 25, 35; P : 0, 50, 60; K : 0, 10, 20kg/ha) on seed yield and quality in Co 2 red gram indicated that the seed yield differences due to application of different levels of nitrogen were found to be highly significant. Application of 35 kg of N with 10 kg of K per ha

and of 25 kg of N with 60 kg of P and 20 kg of K per ha increased the seed yield by 123.25 and 118.91 per cent of control. An yield of 630 kg/ha of quality seeds was obtained by fertilising the crop with 35 kg of N and 10 kg of K/ha.

Seed viability study carried out since September 1974 with both untreated and treated seeds of Co 2 redgram packed in unused gada cloth bag and paper–aluminium foil-polythene laminated pouch and stored under ambient temperature and relative humidity also indicated the usefulness of the seed treatment and paper–aluminium foil-laminated pouch for long term storage of redgram. Among the seed protectants Captan, leaf powder of *Albizzia amara* and fruit powder of *Acaeia concinna* proved effective in minimising the loss in viability. the germination percentages, averaged over the entire period, registered by the seeds treated with them being 83, 70 and 71. respectively as against 63 recorded by the untreated seeds stored In the same container viz.' paper–aluminium foil-polythene laminated pouch.

R.I. Seed Tech: 209 Evolving suitable package of practices for the production of quality seeds in black gram

C. Dharmalingam and V. Ramakrishnan

Seed viability studies with Co 2 black gram seeds were continued since December 1973. It is recommended that for short or long term storage of black gram seeds possessing high initial viability under ambient temperature and relative humidity, they should be slurry treated either with Thiram 75 per cent WDP at 75 g/100 kg seeds in 500 ml of water alone or in combination with DDT 50 per cent WP at 100/kg of fungicide and packed at 7-8 per cent seed moisture-vapour proof container like paper-aluminium foil-polythene laminated pouch, 600-700 gauge polythene bags or air-tight glass or tin containers.

Influence of different seed moisture content at packing in different packaging containers on viability and vigour of Co 2 black gram seeds stored under ambient temperature and relative humidity was continued to be studied since August, 1974. The results indicated that the untreated seeds packed in cloth bag at 11 and 8 percent seed moisture content had completely lost their viability from the initial 97 per cent within 12 months from harvest due to bruchid infestation, while the captan treated seeds in the same container recorded 90 and 88 per cent germination in respect to those packed at 8 and 11 per cent seed moisture content respectively.

The study carried out since August, 1974 to evaluate the influence of seed protectants of plant origin and red earth as well as of different storage containers on the viability of Co 2 black gram seeds revealed that the seeds treated with *Vitex negundo* and tobacco leaf powder and red earth and stored in cloth bag, recorded high germination and field emergence of 90 to 95 per cent while the other seed protectants of plant origin were ineffective in minimising the loss in viability and vigour.

R.I. Seed Tech. 210 Standardisation of seed production technology in Green gram

C. Dharmalingam and V. Ramakrishnan

The trial conducted to study the influence of application of different levels of NPK straight fertilizers (N : 0, 25, 35; P : 0, 50, 60; K : 0, 10, 20 kg/ha) on seed yield and quality in Co 2. Green gram indicated that the seed yield differences due to application of different levels of Phosphorus was found to be highly significant. The seed yield of 1183 kg/ha obtained due to application of 60 kg P/ha was 17.4 per cent more when compared with the recommended schedule of 50 kg P/ha for a grain crop. Per centage recovery of quality seeds was also more in the crop fertilised with higher dose of Phosphorus, while either nitrogen or potash did not affect the seed yield and quality.

Studies carried out with Co 2 Green gram to evaluate the seed quality and production potential of different size grades and seed coat colour categories viz., normal and discoloured seeds, indicated that the normal coloured seeds were superior to the discoloured ones, the mean germination and field emergence of the normal coloured seeds being 80 and 86 per cent, respectively as against 58 and 54 per cent for the discoloured ones.

The study carried out since August, 1974 to evaluate the viability and vigour of normal coloured and discoloured seeds of Co 2 Green gram packed in cloth bags and paper-aluminium foil-polythene laminated pouches with and without chemical treatments and stored at ambient storage conditions revealed that normal coloured seeds irrespective of seed treatment and storage containers maintained high germination of 93 per cent, and vigour even after 15 months of storage.

R.I. Seed Tech. 211 Standardisation of seed production technology in Bengal gram

K. K. Vadivelu, T. V. Karivaratharaju and V. Ramakrishnan

Seed lot of Co 1 bengal gram was graded into seeds of different sizes using 17/64", 16/64", 15/64", 14/64", 12/64" and 11/64" round performated sieves. The initial germination percentages were 100, 94 and 98 for 15/64", 14/64" and 12/64" size seeds and for others which consisted mostly of shrivels and immatures, they were less than 64.

Seed viability studies with Co 1 Bengal gram being continued since 16-8-74 had revealed that both the untreated seeds and those treated with Captan and stored under ambient temperature and relative humidity in paper aluminium foil-polythene pouches remained viable up to 91 and 81 per cent, respectively even after 17 months of storages.

R.I. Seed Tech. 212 Standardisation of seed production technology in Gingelly

V. Ramakrishnan and C. Dharmalingam

The trial carried out between April and August, 1975 to study the influence of the application of straight fertilizers in different levels (N : 0, 50, 60; P : 0, 25; K : 0, 25 kg/ha) on production and quality of TMV 3 Gingelly seeds showed that the seed yield differences due to different levels of application of nitrogen and phosphorus were significant at 5 per cent level. Application of 50 kg of N and 25 kg of P per ha was superior in augmenting the yield to the application of fertilizers in other combinations. The yield obtained due to application of fertilizers at 50-25-25 kg of NPK/ha was 600 kg/ha.

In the study to determine the influence of the application of different levels of potash (0, 12.5, 25, 37.5 and 50 kg/ha) on seed quality attributes in TMV 3 Gingelly, it was found that application of 50 kg of K/ha resulted in low recovery of seed, 33.59 per cent, when compared with 48.5, 45.97 and 44.89 per cent seeds recovered, respectively from the crop raised with 12.5 37.5 and 25 kg of K/ha.

The effect of soil or foliar application of Cu (40 kg/ha, 20 ppm), Mn (20 kg/ha, 20 ppm), Fe (40 kg/ha, 20 ppm), and Mg (5 kg/ha 50 ppm), besides the soil application of 0 and 25 kg of N on seed quality attributes in TMV 3 Gingelly was studied with control for comparison. The seed recovery percentage determined for each one of the macro-and micronutrients and their combinations did not differ significantly.

The effect of different spacings (Row spacing : 20, 30 and 40 cm; plant spacing : 15 and 30 cm) and of application of different levels of N (0, 20, 40 and 60 kg) with 25 kg in each of P and K per ha was evaluated in respect to seed recovery percentage obtained in TMV 3 gingelly, using a 14 x 14 wire mesh sieve, and for 100 seed weight. The differences either in seed recovery percentage or 100-seed weight due to treatments were not significant.

R.I. Seed Tech. 213 Studies on seed production technology in Sunflower

K. K. Vadivelu, T. V. Karivaratharaju and V. Ramakrishnan

In a study to evaluate the influence of different levels of P and K on seed yield and quality in sunflower variety EC. 68413 it was observed that increased application of P at 20, 40 and 60 kg/ha registered 16.1 per cent (685 kg), 37.6 per cent (810 kg) and 46.8 per cent (865 kg) increased seed yield over control (590 kg/ha). Application of 40 and 60 kg of P was very effective in combination with 60 kg of N/ha; the respective yields were 1005 kg and 1040 kg, as against 650 kg obtained with the application of 60 kg N alone.

Seed viability studies with both treated and untreated seeds of Sunflower E. C. 68413 were being continued. Captan treated seeds stored in paper-aluminium foil-polythene laminated pouches gave 85 per cent germination when compared with 76 per cent given by their counterpart stored in cloth bag even after 15 months of storage. The untreated seeds stored in both the containers gave less than 50 per cent germination.

R.1. Seed Tech. 214 Standardisation of seed production technology in Groundnut

C. Dharmalingam and V. Ramakrishnan

In the field trial carried out under irrigation to study the influence of the application of different levels of NPK fertilizers (N : 0, 20, 30; P : 0, 40, 60; K : 0, 60, 80 kg/ha) on the seed yield and quality of POL 2 Groundnut, it was found that the application of 20 kg of N/ha alone gave a seed yield of 2420 kg/ha which was 13.3 per cent more than that from the control plot.

In the field trial carried out between May and August 1975 under rainfed condition at the Groundnut Research Station, Pollachi for determining the influence of seed size on crop growth and yield in POL 2 groundnut revealed that the yield increase in dry pods obtained had shown that seeds of the size 20/64", 22/64" and 18/64" were better than the ungraded.

In the seed viability studies carried out since 1975 with POL. 1 groundnut kernels stored under ambient temperature and relative humidity in cloth bags and paper aluminium foil-polythene laminated pouches with and without seed treatment it was found that the viability of kernels stored in cloth bag was reduced to 26 per cent from 96 per cent initial germination, irrespective of the seed treatment at the end of nine months of storage. Whereas the seeds stored in paper-aluminium foil-polythene laminated pouch with and without seed treatment gave 70 per cent germination and field emergence.

R.1. Seed Tech. 219 Studies on seed production technology in paddy

K. R. Ramaswamy and K. K. Vadivelu

The influence of application of 50, 75 and 100 kg of K/ha in combination with 100 and 50 kg of N and P/ha on seed quality was studied in three varieties of paddy viz., Co 37 (Vaigai), Co 39 (Amaravathi) and C4-63 (Bhavani). Application of 100 kg of K/ha has resulted in getting increased graded seeds to an extent of 879 kg/ha in Co 37 and 263 kg/ha in Bhavani, while in Co 39 an increase of 176 kg/ha was recorded only with an application of 75 kg of K/ha.

To study the influence of spacing on seed quality, a field experiment was conducted with the variety Amaravathi (Co 39). The crop was raised adopting the recommended package of practices but planted at three spacings

viz., 15 x 10, 20 x 10 and 25 x 10 cm. The crop was harvested at 18-19 per cent grain moisture content and hand threshed. The seeds were cleaned and dried to 10-11 per cent moisture content and graded. The per cent recovery of quality seed and seed yields were 95.5, 96.2 and 96.8 and 3110, 3210 and 3140 kg/ha respectively.

9. FOOD TECHNOLOGY

R. 1. Food Tech 201 Processing and preservation of fruits and vegetables
R. Sadasivam

The quality of jack fruit squash could be improved by filtering the juice through a muslin cloth or remove the coarse particles before mixing with the sugar syrup. Storage studies of jack fruit squash revealed that the squashes remained in good condition up to one year under room temperature condition although a slight reduction in ascorbic acid content was noticed.

Preparation of squash from yellow variety of passion fruit with 45° Brix 1.5 per cent acidity and 25 per cent juice was standardised.

R. 1. Food Tech. 203 Evaluation of edible products from Mushroom
A. P. Shanthy

Variation in time of steam blanching was studied. The mushroom were steam blanched for two, three and five minutes. The study revealed that mushroom blanched for two and three minutes were acceptable since they retained their original shape and firm texture, while that blanched for five minutes was soft. However three minutes blanching is recommended for canning purpose since it gives suitable filled weight in cans while the two minutes blanched product gave underfilled cans.

R. 1. Food Tech. 204 Formulation of different recipes from minor millet
A. P. Shanthy

A few ready mixes were standardised from millets *tenai murukku*, white *ragi dosai* and maize *paniyaram* ready maxes were prepared initially. They were packed in 250 g and 500 g polythene packets along with instruction sheet in Tamil. They were released on the Farmers' Day.

A 250 g packet of *Tennai murukku* mix supplies about 965 calories, 26 g protein and 28 mg iron, while about 900 calories and 17.5 g protein are obtained from the *paniyaram* mix. The *dosai* mix is high in protein, minerais and vitamins. It supplies about 760 calories, 38 g protein, 720 mg calcium, 17 mg iron, 1. 0 mg thiamine and 3 mg niacin.

10. AGRICULTURAL ECONOMICS

R. 1. Ag.Econ. 202 Comprehensive Scheme for studying the Cost of cultivation of principal crops in Tamil Nadu

V. Rajagopalan, R. Srinivasn, S. Krishnamoorthy, T. K. Shanmugasundaram, V. Balakrishnan, L. P. Swaminathan and V. Subramaniam

Under this Government of India Project, data on inputs and outputs for paddy, groundnut, sugarcane and cotton crops were collected in 480 selected holdings spread throughout the State. Data on paddy collected during 1971-72 and 72–73 have analysed by D. E. and S. and important findings are betailed below :

The average yield of paddy per hectare was 26.16 q during 1971-72 and 24.80 q in 1972-73. Wide interzonal variations were observed in yield during both the years. The yields ranged from 19.22 q in Chingleput zone to 37.88 q in Coimbatore, Salem, Dharmapuri zone in 1971-72 and from 8.60 quintals in Chingleput zone to 31.48 q in Coimbatore, Salem, Dharmpuri zone during 1972–73.

The overall cost of production per hectare worked to Rs. 1616.18 for the State during 1971-72 and Rs. 1722–71 during 1972–73. Wide inter-zonal variations were also observed in the cost of production per hectare. The cost of production per quintal came to Rs. 53.47 during 1971-72 and Rs. 62.02 during 1972-73. The cost varied from Rs. 47.10 per q in Thanjavur zone to Rs. 61.76 per q in Kanyakumari zone in 1971-72, while the figures varied from 48.93 in Thanjavur zone to Rs. 86.88 in Coimbatore, Salem Dharmapuri zone during 1972–73. Out of the total costs 61.01 per cent formed the operational cost and 38.99 per cent formed the fixed cost in 1971-72 while the corresponding percentages were 63.79 and 36.21 respectively in 1972-73. Human labour constituted the major item of operational cost while the rental value of owned land formed the major item of the fixed cost.

R.1. Ag. Econ. 220 A study of growth pattern of labour force in Coimbatore Taluk

P. K. Aiyasami and B. Natarajan

A study on growth pattern of labour force in Coimbatore taluk was undertaken to investigate the pattern of employment, unemployment and occupational disposition of labour force in four randomly selected villages in Coimbatore taluk classified as rural. One hundred sample households constituted the sample size. The average size of the families being 5.08, nearly 41.5 per cent belonged to the age group of 15-34 and 23.6 per cent to the age group of 35-59, thus the employable age group accounted for 65.1 per cent.

Out of 58 members, 232 members (i. e. 45.67 per cent) were earners Of this 51 were owner farmers, two tenants, six owner-cum-tenants and 97 agricultural labourers. Of the remaining, 55 were employed in industries and 21 in the service sector. The industrial labourers were working as fitters, machine operators, blowers, moulders and smiths. The earners in the service sector belonged to the category of secondary grade teachers, physical training teachers, bus conductors, bill collectors in the panchayat office and junior assistants in office establishments. In general all men residing in rural areas and working in the service sector and industrial establishments were working in jobs of a medium and below medium type. They preferred to be in the village since cost of living was comparatively low and 31 of them has their own farms which is a source of additional income, besides confering social status and facilities of rural life with an urban orientation. Others had their own residences in the villages and they opted to continue there and enjoy preferences, out of the 100 house holds 51 were satisfied with the present jobs since it suited their skills, knowledge and attitude towards life, The remaining 49 per cent have expressed a desire for an occupational mobility and this is primarily due to low income earning potentials in the present job. About the specificity of future plan, only 12 households had a plan of action and are actually exploring for job opportunities. Nearly 40 per cent of the households belonging to agricultural labour class expressed a strong desire for switching over to non-farm occupations of an unskilled type in factories and industrial establishments.

The average wage earnings of agricultural labour was Rs. 2.50 to 3.00 for women and Rs. 4.00 to 5.00 for men for days of regular employment. For arduous operations like digging well, daily wage rate for men labour was Rs. 6.00 and this is seasonal and only able bodied men were preferred. Non-farm employment of the types indentified was restricted to mean labour only and the average wage rate was Rs. 5.25 during the temporary service period offering prospect of higher salary and fringe benefits after one year of service. Most of the days in a month, they were assered of employment and hence regular wage earnings. Monthly incomes of a regularised employee ranged from Rs. 160 to 360/-. The disparity in income levels and employment opportunities lured agricultural labourers towards non-agricultural avenues. An analysis of the trend in employment indicated that people who were in agricultural prior to 1965 was 179 and this has tended to decline by 9 per cent whereas those in industrial employment have shown a slight increase and similar has been the case in case of service sectors. Farming provided employment for 12.17 per cent for 300 days and more. 7.05 per cent for 251-300 days, 25.64 per cent for 200-250 days and 26.9 per cent for 151-200 days, and 28.19 per cent for less than 151 days. Thus more than 54 per cent has employmant for less than six months.

Non-farm occupations ensured employment for all through the year for 75 per cent and hence labour preference towards an occupational shift.

In peak season, agricultural labour worked on an average for 10 hours 43 min/day and during slack periods for just 7 hours 23 min/day while this was eight hours on an average in non-farm jobs. Regarding limiting family sixes, it was noted that out of 100 respondents, only 89 were married. Of this, only 32 were aware of the devices for family planning. while 19 of them were actually adopting birth control measures. The remaining were not in favour of following these measure.

Twenty four (27 per cent) respondents preferred to have one male and one female child; and 17 (19 per cent) of them preferred to have two males and one female child. Nobody preferred to have more than four children.

Policy implication: The respondents. particularly agricultural labour have expressed a strong desire for occupational mobility, and preference is for unskilled industrial employment. This is due to unfavourable wages and service conditions in the agricultural sector. This drift has to be arrested by making labour in rural setting more attractive and renumerative.

R. 1 Ag. Econ. 221 Formulation of optimum Farm Plants for crop, live stock and other enterprises
A. Kandaswamy and C. Arputharaj

At the joint meeting of Research Council and Extension Education Council held on 8-6-75 at Madurai, it was suggested that the formulation of optimum farm plans may be taken up as a continuous program. Ten farms were selected from the farmers' discussion group attached to the Farmer's Training Centre, Coimbatore. The ten farms were visited and farm business survey was completed. Out of this, two optimum farm plans were prepared and sent to the concerned farmers. These plans offer scope for increasing farm income by more than 50 per cent with existing resource level.

R. 1 Ag Econ. 222 Effect on multiple cropping programme on employment potential and demand for farm credit
V. Meenekshisundaram and P. Zeaudeen

Studies on effect of multiple cropping programme on employment potencial and demand for farm credit in Coimbatore and Madurai regions revealed the following.

Wetlands: In Coimbatore three crop sequence of rice varieties (Bhavani, Kannaki, IR. 20) has given the maximum net return of Rs. 10,095 per hectare and has generated additional labour employment to the tune of 15 bullock labour days and 47 mandays over the 2 crop sequence (Bhavani after Bhavani) in normal practice. The sequence of three rice crops has involved and additional expenditure of Rs. 2.275/- and the additional return has been Rs.860/-In A'ya , inclusion of one catch crop of Sunnhemp in between IR. 20 and Co. 33

resulted in an increase of return by Rs. 210/- for an additional investment of Rs. 162/-. Since it invites cattle menace when surrounding area is kept follow it was not prefered by the farmers. In wetlands of Madurai region introduction of cotton P216F as summer crop resulted in an increased return of Rs. 12,300/- for an additional cost of Rs. 3,236/- per hectare. But case studies indicated farmers' negative response for its adoption as they were not conversant with cotton cultivation. Further water is a severe constraint to raise a third crop.

In the case of garden lands the sequence of cotton (PRS.72) followed by cotton- *bhendi* mixture (MCU 5 and Pusa Sawani) resulted in an additional return of Rs. 4,480/- for an additional cost of Rs. 626/- besides creating additional employment opportunities of 154 man days. But the case studies indicated unawareness of the farmers about the variety PRS 72 cotton for Coimbatore garden land tract and cent per cent of the farmers expressed their unwillingness to dispense with cholam as it constitutes the principal source of supply of fodder for maintenance of livestock. The rationale behind the choice of the sequence of cotton after cotton is questioned as growing of malvaceous crop continuously increase the scope for spread of pest and diseases. The possibility of reduction in yield of cotton due to cultural operations to *Bhendi* at a time when cotton is in bud formations stage has to be given due consideration, In Aliyar 3 crop sequence of groundnut (Pol 1) redgram (Co 1) and maize (Ganga 5) has given, an additional return of Rs. 3,940/- for an additional cost of Rs. 1,309. i.e. the addional return is twice the added cost. It has also created additional employment for 1 bullock day and 256 man days. But case studies in Aliyar indicate that only two crop sequence of paddy followed by groundnut is feasible in areas where seepage effect is found. The farmers indicated their preference for paddy followed by *ragi* or *thenai* or cumbu or horsegram depending upon the availability of water. As Parambikulam Aliyar Project is designed to increase agricultural production through cultivation of irrigated millets the feasibility of millets in combination with groundnut have to be tried. The trial results in Bhavanisagar indicated the preference of the four crop sequence of *ragi* (Co 7) tobacco (Vazhaikappal) *Bhendi* (Pusa sawani) and *bajra* (HB 1) as it yield the highest net return of Rs. 3289/ha as against Rs. 2635/ha obtained in the normal 2 crop sequence locally (Ragi Co 7 and Tobacco-Vazhikappal). The additional labour employment was 12 bullock labour days and 291 mandays. The additional demand for credit worked out to Rs. 2480. The case studies with 6 farmers indicated their negative response to the crop sequences tried by the Agricultural Research Station, Bhavanisagar as they possess neither water nor managerial efficiency for management of water resource for multiple cropping. The sequence of (i) cholam, *ragi* or groundnut (ii) cotton, *samai* or groundnut and (iii) cotton, *ragi* may be introduced in the trial combinations for effective suggestions useful to the farming community.

R. I. Ag. Econ. 226 Energy crisis as affecting farm production in Tamil Nadu
R. Srinivasan, L. P. Swaminathan, T. K. Shanmuga sundaram and V. Balakrishnan

The study on energy crisis as affecting farm production in Tamil Nadu was undertaken with 103 farmers owning power operated machinery, who were selected under the Comprehensive Scheme for studying the cost of cultivation of principal crops in Tamil Nadu. Emphasis was laid on the energy crisis due to power cut imposed in the State during 1972-73.

The study revealed that the farmers experienced problems due to the combined effect of dearth of available water in the wells coupled with the power cut imposed. The electricity consumption per hectare was less in 1972–73 compared to 1973-74 in all the districts. Increase in gross cropped area was observed in 1973-74 over 1972-73, the year of power cut. There was decline in paddy area in all the districts and increased area under groundnut in the districts of Chingleput, North Arcot, Madurai and Trichy during 1973-74. Area under sugarcane showed increase in Trichy, Coimbatore and Salem districts. As regards labour utilisation both upward and decreasing trends were observed, which may be attributed to change in crop mix. No large scale substitution with oil engines and bullock power in the place of electric motor was observed. Net returns per hectare when compared over the two years was found to be less in all the districts during 1972-73 as compared to 1973-74. Farmers experienced inconvenience and losses due to coil burning as a result of untimely and interupted power supplies during 1972-73. As regards oil engines, the next major source of farm power, farmers expressed difficulty in the procurement of diesel oil, that too over a short period. The problem faced by the sample farmers was one of the lack of availability of water supply than the oil price hike and its short supply.

R. I. Ag. Econ. 235 Chapter on Agriculture for Pudukkottai District Gazetteer
V. Rajagopalan, P. K. Aiyasamy, M. Sivanandam and R. Sundaresan

The writing up of the Chapter on Agriculture for the Pudukkottai Gazetteer was entrusted to this department as requested by the Director of Agriculture. In the chapter emphasis was made to identify the resource base and its structure in terms of land, soil, water, climate, vegetation, human and livestock resources and to examine their use pattern. An assessment was also made of the existing state of the affairs of infra-structural facilities like roads and communication, markets and marketing, banks and financial institutions and to decide a strategy for agricultural development recognising the assets and liabilities status of the district. In writing this chapter a new approach was made to give a development orientation to this chapter in the context of the assets on the agricultural side and suggest guidelines to

promote overall rural development. This would give proper comprehension of the district and help in designing goal based on extension programmes.

R. 2. Ag. Econ. 204 Studies on the off-take of fertilizers vis-a-vis credit needs at farm level

V. S. Narasimhan, S. Kombairaju and C. S. Deivavel

The study was carried out in two Panchayat Unions of Natham and Alanganallur of Madurai district representing garden land and wet land respectively. The study covered 100 farmers 50 in each Panchayat Union spread over in five villages in 1973-74.

Fertilizers were applied only to the irrigated crops. 82.46 per cent and 92.04 per cent of the gross irrigated area were applied with fertilizers respectively in Natham and Alanganallur unions. With regard to individual crops about 95 per cent of the area under paddy and sugarcane were fertilized in Natham, whereas 100 per cent of the area of these crops were fertilized in Alanganallur. In the case of cotton and groundnut the area fertilized was 69 per cent and 53 per cent respectively in Natham whereas it is 48 per cent for groundnut in Alanganallur block. The average quantity of N, P and K applied per hectare of fertilized area was 65.7 kg, 34.1 kg and 34.0 kg respectively in Natham and 97.56 kg, 39.0 kg and 34.2 kg in Alanganallur block. Due to fertilizer shortage the farmers have applied more quantities of organic manures than the recommended doses to compensate the shortage of inorganic fertilizers.

Farmers who availed co-operative credit applied 18 per cent and 28 per cent more of plant nutrients (N P and K) respectively per hectare than those who have not availed co-operative credit, in Natham and Alanganallur block.

Regarding preference for different types of fertilizers the farmers, preferred complex for basal dressing and urea for top dressing to paddy. For sugarcane in Alanganallur factory area farmers preferred mixtures.

11. AGRICULTURAL EXTENSION

R. 1. Ag. Extn. 209 Study on the retentivity of knowledge gained through selected extension methods and their combinations

V. S. Subramanyan

The additional findings under this project in respect of the suitable combinations of extension methods for farmers differing in their age and educational status, reveal that the combination of talk with slides + talk with flannel graphs + exhibition cum demonstration + discussion and another combination of exhibition cum demonstration + discussion are the most effective combinations for educating all types of farmers. These are highly useful particularly for either old or less educated farmers. If the audience is

either young or well educated, two other combinations such as (1) talk with flannel graphs+discussion; (2) talk with slides+discussion will also be effective. Of these two, the farmer is preferable because of its relatively higher effective and ease in preparation and use. Further talk with flannel graphs is highly valuable and practicable especially in these days when the production of colour slides is costly.

R.I. Ag. Extn. 210 A study on the effectiveness of soil testing in increasing agricultural production in Coimbatore District
V. Srinivasan and K. Nanjaiyan

The additional findings of the project in relation to the effectiveness of the adoption of Soil Testing Laboratory recommendations in increasing crop yields, have shown that, the increase in yield of paddy ranged from 5 to 200 per cent with an average of 14 to 16 per cent over the normal yield. In cotton, the increase in yield ranged from 7.14 to 33.3 per cent with an average of 14.52 per cent, in cumbu from 20 to 30 per cent with an average of 26.82 per cent, in groundnut from 4.39 to 25 per cent with an average of 11.28 per cent and in *ragi* from 13.09 to 25 per cent with an average of 19.64 per cent.

R.I. Ag. Extn. 213 Role of Farmers Training Centre in developing new leaders and to measure how far these leaders act as extension agencies
K. Lakshmanan and K. Chandrakandan

In the study to find out the role of Farmers Training Centre in promoting leadership, one-third of the convenors of the Farmers discussion groups were rated as superior in leadership role while an equal proportion was considered as average and some proportion as inferior. Majority of the convenors were found to be in average level in respect of their individual functions as well as in overall performance as extension agents. The study revealed that the convenors were relatively more educated, had larger farms, more income, higher social participation and more material possession. They all were highly progressive than their followers.

R.2. Ag. Extn. 205 A study on the attitudes of agriculturally educated youth in going back to their own farm to utilize the knowledge gained in the training
M. Muthiah and S. Somasundaram

A study conducted among the final year B. Sc. (Ag.) students of Tamil Nadu Agricultural University revealed that only 5.6 per cent of them were willing to go back to their own land to utilize the knowledge gained, 66.1 per cent preferred institutional job and 28.3 per cent would like to continue higher studies. The reasons attributed by them for not taking up farming as their profession were :- 1) Non availability of land (23.32 per cent), 2) Other family members were already engaged in farming and hence not profitable to

share with them (29.44 per cent), 3) Their elders in the family want them to be in service (52.22 per cent), 4) Assured income needed to meet the family needs (41.11 per cent), 5) Not confident enough to take up farming indepently (11.66 per cent), 6) Opportunities to educate children more in cities by taking employment (32.22 per cent), 7) Service more prestigious (31.66 per cent), 8) City living joyful and glamorous (21.66 per cent).

However, about fifty eight per cent of the students were willing to do farming if the Government or Nationalised Banks helped them financially to acquire required lands and other necessary inputs. Under each conditions they preferred farming because :-

1) Self employment was better than subordinate service, 2) Pleasant rural life, 3) Scientific agriculture, a profitable profession. But twenty five per cent of them were not willing to take up farming because :-

1) They attached more prestige to be in service, 2) Wanted a change since parents were already engaged in farming, 3) Unmanageable practical difficulties in farming, 4) Needed assured income, 5) Lack of confidence in independent farming. Eleven per cent of them were willing to continue higher studies only.

12. SOIL AND WATER CONSERVATION ENGINEERING

R.I. S&WC. 201 Drip irrigation studies in vegetable crops
R. K. Sivanappan and D. Palaniswamy

Drip irrigation studies were continued for various vegetable crops such as chillies, radish, beetroot, brinjal, tomato, bhendi and sweet potato and the results obtained have indicated that there is a saving of irrigation water to an extent of 60 to 80 per cent compared to the conventional method of (surface) irrigation without affecting the yield. To economise the cost of installation, pipes made of different material and different sizes and also holes with and without sockets were tried. Lateral pipes were placed on the ground and buried below ground for irrigation. The cost of installations was found to be around Rs. 10,000/ha. Effect of drip irrigation on papaya is under study.

R.I. S&WC. 202 Water requirement for rice
R. K. Sivanappan and E. S. A. Saifudeen

Water requirement of high yielding rice varieties namely Co 39 (Amaravathi) was estimated and compared with the water saving method. It was established that about 35 per cent of water saving can be achieved without sacrificing yield in the water saving method. The percolation loss was estimated to be around 26 per cent.

R. I. S & WC. 203 Ground water studies to correlate recharge with use of water
D. Chandrasekaran and E. S. A. Saifudeen

Based on the observations made in thirty nine bore wells selected in the different parts of the University campus, it has been found that the ground water level in the Paddy Breeding Station and Wet land areas remain on average almost at a constant value whereas, it has been steadily decreasing by about 3.5 m in the Millet Breeding Station area since 1971. Due to hard rock formations in the Millet Breeding Station area, the water level is not subjected to large fluctuations by recharge and discharge events.

R. I. S & WC. 204 Evaluation of irrigation methods for MCU 5 cotton
R. K. Sivanappan and E. S. A. Saifudeen

The object of the experiment is to economise the water in cotton cultivation without affecting the yield. Various methods of irrigation for MCU 5 cotton were experimented to find the one most in water use without reduction in yield from 1971-73. The long furrow method was found to be ideal compared to border strip and check basin and the water saved in long furrow method was about 30 per cent without affecting the yield. Experiment on further economising by skip furrow and alternate furrow conducted from 1974-76 have proved in successive seasons that about 40-50 per cent of water could be saved in addition to additional yield of pulses in the vacant spaces in the skip furrow method. The water used and the yield obtained during the last season ('74-'75) for the 3 methods namely control, alternate furrow and skip furrow are 43.00 cm, 28.32 cm, 22.07 cm (excluding rainfall) and 2016 kg/ha, 2010 kg/ha, 1908 kg/ha respectively.

R. I. S & WC. 205 Sprinkler irrigation studies for MCU 5 cotton
D. Chandrasekaran and E. S. A. Saifudeen

In order to find the efficiency of sprinkler for irrigation, experiments were conducted on MCU 5 cotton for 5 seasons since 1971 until the date (1976). Though it has been observed that by sprinkler irrigation 10-30 per cent of irrigation water can be saved, the advantage is not distinctive when compared to furrow irrigation in view of the difficulty of ensuring uniform spray in windy days and the increased evaporation loss in the sunny days. However, it has definite advantages over the flood irrigation.

R. I. S & WC. 210 Drip irrigation studies on banana
R. K. Sivanappan

The object of the study was to study the response of banana crop for drip method of irrigation and also to assess the water requirement of the crop. Three treatments namely, drip with holes, drip with holes and sockets, and control were used for the study. The water was given daily/alternate days for drip plots and once in 7-10 days for control, depending upon the

depletion of moisture in the soil (irrigation was done at 50 per cent A. M). The water used and the yield obtained for drip and control plots are 58 cm and 243 cm and 15.31 kg/plant and 15.95 kg/plant respectively. The weed in the drip plot was only 1/3 of the control plot. Hence the drip method could be adopted for banana crop for saving water.

R. I. S & WC. 211 Drip irrigation studies for sugarcane
R. K. Sivanappan and M. Prasad Rao

This research work is being carried out in colaboration with the Sugarcane Breeding Institute, Coimbatore. During the first season saving of 50 per cent of irrigation water was observed in the drip field compared to control irrigation and was also recorded that the percentage of germination was very high in drip and there was no significant difference in yield. The experiment is repeated during the second season with one more additional treatment, i. e., with skip furrow and as on date 50 per cent of water saving is observed in drip and 30 per cent in skip furrow compared to control method.

R. I. S & WC. 214 Water requirement for groundnut crop in the Agricultural Research Station at Aliyarnagar
S. Subramaniam and Koteeswaran

Water requirement for POL 2 groundnut was taken up by varying the irrigation frequency both in the vegetative-pegging phase and pod formation-maturity phase. The treatment of irrigation of once in 12 days during vegetative-pegging phase and once in 6 days during the pod formation-maturity phase recorded the highest yield of 1133 kg/ha (the yield had been reduced due to pest attack) and the total requirement of water for the sandy loam soil was estimated as 67.43 cm.

R. I. S & WC. 215 Drainage studies in the Agricultural Research Station at Aliyarnagar
S. Subramaniam and Koteeswaran

In paddy fields of sandy loam soil surface drainage system with intercepting ditches was continued for the third year. Bhavani paddy was raised in all the three years and yield due to the provision of drainage had given remarkable increase upto 5340 kg/ha in 1973 from the original yield of 1500 kg/ha in 1973.

R. I. S & WC. 216 Examining the effectiveness of water harvesting technique in a typical watershed basin
D. Chandrasekaran and E. S. A. Saifudeen

In the D block of Thoppampalayam area at the Agricultural Research Station, Bhavanisagar, an experimental watershed of 6.4 hectares area has been selected for collecting wasteful run-off at the time of rainfall and utilising the same for irrigation at the crucial junctures of crop requirement.

It has come into light that only very little run-off is produced even during heavy rainfalls due to the higher infiltration capacity of the soil. Even this little flood seeps through and travels sidewards in the sub-soil without being visible on the surface. To study the quantity of sub-soil seepage flow and to reduce the infiltration capacity of the soil by land treatment, arrangements have been made. The project is under progress.

R. 7. S & WC. 217 Studies on seepage using different lining for storing water in the farm pond
S. Subramaniam and M. Koteeswaran

For storage ponds of run-off farming and fish pond, seepage studies to evolve suitable and economic lining was taken up. The following linings were found useful in retaining water. Soil : cement 8 : 1, black polythene sheet 400 guage, whilt polythene sheet 600 guage, and soil : bitumen 15:1 (by volume). Many other combinations were also tried including that of soil-cow dung-paddy straw and soil-cow dung-coconut fibre, but finally soil : cement 8 : 1, 2.5 cm thick was concluded as economical and this information is recommended for water harvesting technique in dryland agriculture.

R.19. S & WC 203 Water requirements for rice
R. Karunanithi and A. Paneer Selvam

In respect of water management practices, it was found that during October season irrigating loamy soils once in two days to a depth of 5 cm, gave better yield than irrigating daily or once in three days, under Pondicherry conditions. The yield in terms of total dry matter production (10,423 kg/ha) and transpiration ratio were efficient in irrigating once in two days with IR 20 rice.

During summer seasons in rice *Amaravathi* (Co 39) similar results were obtained and irrigation once in two days gave two times (3680 kg/ah) that of yield by irrigating once in three days. *Amaravathi* rice required 75 cm of water (excluding rainfall 21.8 mm).

Out of the total water required 105 cm for rice of 90 days duration (*Amaravathi*) it was estimated that 19 per cent of water is required for nursery including nursery preparations, 9.5 per cent of water is required for field preparations for transplanting and the remaining 71.5 per cent water is required for crop growth until harvest. The water required during crop growth is much influenced by the rainfall and its distribution pattern.

13. FARM MACHINERY

R. 1. Fm. Mach. 224 Design and development of dryland farming implements such as (i) Sweep, (ii) Chisel plough and (iii) Furrow openers for drills in collabration with the dry farming research centres

T. R. Narasimhalu and V. Murugesan

i) Sweep: A study on the conservation of soil moisture by working the implement revealed that the moisture content was more than in the control plots. This additional moisture is useful for crop growth. When used as an intercultivator in line sown crop of *jawar*, the cost of operation per hectare for sweep and manual weeding were noted to be Rs. 19.80 and Rs.53.35 respectively. The savings in cost of operation by using sweep was 62.5 per cent.

ii) Chisel plough: Trials were conducted in the fields having hard pan. From the soil moisture data collected at 15 cm, and 30 cm depth, it was noted that higher soil moisture was retained in the treated plots than in the control plots, resulting in a higher yield of 518 kg in *ragi* crop in 0.15 ha as compared to the yield of 447 kg from the control plots, the increase in grain yield being 15.8 per cent.

R. 1. Fm. Mach. 225 Development and testing of paddy harvester

T. R. Narasimhalu and N. Balasubramanian

A new power tiller operated paddy harvester has been developed. It consists of a three assemblies viz., cutter bar, a conveyor and a reel. The machine is found to successfully harvest paddy in row crop. When worked in Bhavani variety of paddy crop, the deflection of the windrowed crop was 48° which was convenient for collection and bundling. The shattering loss recorded was one per cent as compared to the loss of 0.2 per cent caused during manual reaping.

R. 1. Fm. Mach. 226 Studies on selected seed/seed cum fertillizer drills

C. R. Shanmugham, G. Devadason and N. C. Vijayaraghavan

A five cup feed type seed drill with shoe type furrow opener developed at the Zonal Research Centre was tested successfully for sowing cotton, wheat blackgram and greengram, besides the other crops already reported. The row to row and seed to seed distance can be changed to suit the different types of crops. Compared to the conventional method of dibbling behind country plough which requires 3.0 man days per hectare, the seed drill gave a saving of 60 to 80 per cent on time and 50 to 70 per cent on the cost of operation.

The weight of unit was reduced from 267 kg to 197 kg i. e. a reduction of about 70 kg in weight. The draft reduction obtained by the modification was about 10 kg i. e. from 92 kg to 82 kg.

14. AGRICULTURAL PROCESSING

R. I Ag. Proc. 202 Development of modified Paddy Pre-cleaner
K. T. Narayanan and J. Selvarajan

A paddy pre-cleaner has been developed and tested. This pre-cleaner consists of a rotary sieve an aspirator and an oscillating box containing two sieves. The air system consisting an aspirator will remove the dust and other impurities lighter than paddy, while the paddy, moves from the rotary sieve to the oscillating box. The rotary sieve acts as a scalper, wherein the foreign particles larger than the size the paddy are removed. The other impurities such as clay balls, sand, metal pieces etc. are separated by the sieves of the oscillating box. The capacity of the cleaner is 190 kg. of paddy per hour and the cost of cleaning is Rs. 2.35 per quintal, at a cleaning efficiency of 97 per cent This machine is operated by a 1 H.P electric motor. The cost of this unit is Rs. 6500/-.

R. 1. Ag. Proc. 203 Development of a Grain Winnower
C. T. Devadas and M. Ramanathan

A grain winnower has been fabricated and tested. This unit consisting of a feed hopper with a finger type roller, an oscillating box with sieve assembly and a blower. The winnower will reduce the load on the cleaner cum grader and make the upgrading of seeds efficient and fast. The out-turn of the winnower is found to be 675 to 700 kg per hour. The cost of unit with 2 HP motor is Rs. 5000/-. The cost of winnowing is Rs. 0.50 per quintal.

R. 1. Ag. Proc. 215 Design and Development of a sheller for sunflower seeds
C. R. Shanmugham and K. Rangaswamy

A large capacity of sunflower seed sheller gave an output of 150 kg. of seeds per hour. The grading and shelling of seeds and separation of kernels are done in one operation. There is an additional net profit of about Rs. 585/-per tonne of seeds.

Oil analysis revealed that reduction in fat acidity for maintaining the keeping quality and increase in saponification number for more soap will be obtained from the oil from kernel.

R. 1. Ag. Proc. 214 Fixing up the optimum stage of harvest in rice
S. Ramiah and G. Doraiswamy

Harvesting experiments conducted on Bhavani rice variety revealed that the grain yield was high when harvested on the 34th day after 50 per cent flowering. The head rice recovery and out-turn were also high (98.42 per cent and 77 per cent respectively) when harvested on the 34th day.

R. 1. Ag. Proc. 216 **Effect of nitrogen on milling qualities of paddy grain (IR 20)**
S. Ramiah and G. Doraiswamy

The broken percentage was high (9.4) when 200 kg. N/ha was applied in three equal splits and low (5.2) when applied in a single basal dose. It was minimum (2.5 per cent) when 100 kg. N/ha was supplied as a single basal application.

R. 1. Ag. Proc. 219 Trials on Paddy Cleaners
K. T. Narayanan and G. Doraiswamy

Satake pre-cleaner developed by the Agricultural Processing Department was evaluated on paddy. The rate of cleaning was varying from 183 kg/m to 191 kg/m. The cost of cleaning was varying from Rs. 2.35 to 2.45 per quintal. During the operation, no breakage of grain was noticed.

R. 1. Ag. Proc. 220 Studies on drying
K. T. Narayanan and G. Doraiswamy

Paddy grains were dried in mechanical driers, by sun drying and shade drying methods. In mechanical drying, the drying rate varies with different airflow rates. The airflow rates of 20 to 30 CFM/cuft. were found to be optimum. A reduction of 18 per cent of moisture (from 30 to 12 per cent) was observed in 5 to 6 hours in mechanical drying whereas in sun and shade drying methods, the reduction in moisture was observed only 5 to 6 per cent in 6 hours. Mechnical drying of paddy reduced breakage during milling (1.30 to 1.93 per cent) The breakage was comparatively more in sun drying 2.83 %)

R. 1. Ag. Proc. 228 Effect of plants products and non-toxic substances on store product pests
K. Asaf Ali and A. Dakshinamurthy

Five plant products viz., Neem leaf powder, Neem kernel powder, Neem seed coat powder, Pungam leaf powder and pyrethium dust and two inert materials, paddy husk ash and 15 per cent salt solution were mixed with ADT. 31 (1:100) paddy and kept in storage for one year. Periodical observations revealed that the treatments with neem kernal (0.42 per cent) and salt solution (0.24 per cent) were quite effective in preventing the pest infestation when compared to other treatments.

R.1. Ag. Proc. 229 Chemical control of store pests of paddy
K. Asaf Ali and A. Dakshinamurthy

The impregnation of gunny bags with different chemicals viz. phoxim, sumithion. malathion, quinolphos 1000 and 1500 mg a.i/sq. meter revaled

that malathion 1500 mg ai/sq meter is superior for storage of paddy for a period of one year. The cost of treatment per bag is twenty paise per bag of 50 kg, which will avoid a loss of 1.5 kg of paddy in one year.

R. 1. Ag. Proc. 231 Biochemical qualities of paddy grain in relation to salt treatment
V. Subramanian

Salt solution spray (15 per cent Nacl) at one day interval from 25th day to 34th day after 50 per cent flowering in ADT 31 and CO 33 paddy were done. The carbohydrate and amylose contents were not affected due to salt spray in ADT-31 paddy and the protein content tended to increase slightly. In CO 33 paddy, there was a small increase in carbohydrate and amylose content due to salt spray. The cooking quality of salt sprayed grain was also studied. The solids lost in gruel was more in salt sprayed ADT 31 grains and the alkali spreading values got reduced due to salt spray. In CO 33, crater uptake number and swelling number were reduced in general, except in a few stages. Solids lost in gruel were reduced due to salt treatment particularly in later stages of maturity and alkali spreading quality was not affected. The germination capacity of both the rice varieties were not affected by salt spray treatment.

R.1. Ag. Proc. 232 Changes in nutritive quality of paddy grains during storage
V. Subramanian

Paddy grains of Vaigai variety were stored for one year in gunny bag, polythene lined bamboo bin, plastic silo and Hapur bin. The grains were analysed for biochemical qualities at periodic intervals. Carbohodrate content showed a decreasing trend in all the structures studied. Samples stored in plastic silo and Hapur bin recorded higher values of carbohydrate contents. The amylose content did not very much due to storage structures. The paddy stored in plastic silo was found to contain low oil content and fat acidity values. The fat acidity values were comparatively high in grains stored in gunny bags. Soluble extracts, increased in samples stored in polythene lined bamboo bins.

15. AGRICULTURAL STRUCTURES

R.1. Ag. St. 201 Development of sewage gas plant
K. R. Karai Gowder and K. Swaminathan

Gas analysers of 250 ml capacity has been devised and put to use. The percentage of carbondioxide in sewage gas vary from 20 per cent to 35 per oent and the percentage of moisture content vary from 10 per cent to 20 per cent. The digested sludge was found to contain 2.87 per cent to 3.3 per cent, nitrogen, 3.30 per cent to 6.05 per cent phosphorus and potash 1.75 per cent to 2.32 per cent.

R.1. Ag. St. 204 Design and Development of poultry equipment
R. P. Natarajan and K. Swaminathan

A poultry feeder of 10 kg capacity was developed considering the effects of the angle of repose of the material. The cost of the devoloped feeder is Rs. 55/-. In the newly developed feeder the vertical wall is made into a conical shape, which facilitate easy flow of material and is found to be working satisfactorily.

16. BIOLOGY

R.1. Biol. 102 Evolving virus-free material with the aid of tissue culture technique
C. Padamanabhan and G. Pathmanabhan

A procedure was developed to obtain the plants free from blackgram leaf crinkle virus, by shoot meristem culture in Co 1 blackgram *Phaseolus aureus* L.) Blackgram meristem (300-500 M in length) when transferred into B 5 medium supplemented with sucrose (2 per cent) kinetin (0.05 mg/l) and NAA (1mg/l) and incubated in a growth chamber programmed to have a light and dark cycle of 10 hr/day (3200 lux), 26° + 2°C and 60-70 per cent relative humidity. Atleast 60-80 per cent of the meristems regenerated into normal plantlets in 20-25 days. In the absence of growth promoting substances there was no differentiation into shoot and root systems, only callus tissue formed. About 10 per cent of plantlets were free from viral infection.

Meristem tip culture free from Cassava Mosaic Virus from Cassava (*Manihot utilissima* var. Malavella) were obtained in Murashige and Skoog medium. Higher concentration of kinetin in the medium encouraged only callus growth whereas high NAA induced development of small roots. Meristem tips not exeeding 0.5 mm produced only callus while shoot and root differentiation were recorded with 1-2 mm meristems. Potato virus x free plantlets were obtained from infected potato cultivar Red Eyed President by meristem tip cultures.

R. 1. Biol. 105 Production of haploid plants by adopting anther culture in banana and other plants species
Manimekalai Gurunathan

Growing of haploid plants from the pollen grains of banana, tobacco, tomato, brinjal, chilli, petunia and datura was attempted by adopting anther culture technique. It failed with various varieties of banana. A limited number of haploid plants were obtained from the anthers of *Nicotina tabacam* in a nutrient medium supplemental with coconut milk. In case of chilli, tomato and petunai, only callus tissue formed from the anthers in Murashige and Skoog medium. In *Datura*, the anthers produced a number of haploid

plants in Nitsch medium supplemented with coconut milk after two months. The production of haploid plants varied greatly according to the stage of development of microspores in the anthers. Anthers containing uninucleate microspores respondend well to the culture medium and the pollen grains developed into pollen embryoids.

B.1. Biol. 201 Silkworm rearing and silk productivity utilising different varieties of mulberry leaves

N. V. Radha, S. Letchoumanane and Rajeswari Sundarababu

Among the 15 different races (10 parents and 5 hybrids) reared in the different seasons during the year, Kalimpong A, C-Nichi, NN6D (Parents) and NN6d x KA, KA x NN6D, PA 10 x KA (hybrids) were found suitable for rearing under Coimbatore conditions.

The study on incidence of mealy bug on nine varieties of mulberry crop was carried out at periodical intervals. The percentage of infestation ranged from 20 to 100. Maximum infestation was recorded in Kanwa-2 and the minimum in Kaironezumi.

R.1. Biol. 202 Studies on the ecology of honey bees

N. V. Radha and S. Letchoumanane

Observations on the frequency of visits of honey bees to sunflower in Field No. 37 indicated that the visit was maximum during June (24.0 to 53.0 per cent) and lease in April (14.0 to 21.0) when the crop was sprayed with the insecticides.

The frequency of honey bee visit to sunflower under different ecological conditions during July to November, 1975 was found to be statistically significant in different ecosystems. The average number of visit per head was more (4.76) in the field No. MBS. 4 where there was no spraying of insecticides through out the period. In the case of field No. NA 4 and 37, the average number of visit was significantly less (3.59 and 3.77, respectively) since these fields were surrounded by various crops like cotton, groundnut, gingelly, cumbu, brinjal and tomato which were sprayed with different pesticides as plant protection schedule.

Observations recorded on 36 varieties of banana at Orchard during the period July to December indicated that the percentage of honey bee visit to banana flower was 29.6 and that of *Melipona* 67.2 and a wasp 3.2.

R.1. Biol. 203 Development, multiplication and supply of rhizobium cultures for various leguminous crops grown in Tamil Nadu

G. Oblisami and K. Balaraman

A field trial to study the effect of composite cultures of *Rhizobium* sp isolated from greengram, blackgram and groundnut was conducted on Co 1 greengram at Agricultural Research Station, Bhavanisagar. The composite

cultures containing all the three strains gave better nodulation and pod yield than the individual strains.

A field trial to study the effect of *Rhizobium* sp., *Azotobacter chroococcum* and *Bacillus cirsulans* as seed treatment on POL 1 variety of groundnut was conducted at Agricultutal Research Station, Bhavanisagar. There was not much variation in the nodulation between the treatments due to different organisms. Pod yield was maximum in rhizobium treatment (2370 kg/ha) followed by the treatment of *Rhizobium* plus *B. circulans* (2300 kg/ha).

Field trials were conducted to know the nodulation pattern in the germ plasm collections of sunnhemp, blackgram, greengram, redgram and bengalgram. Of the 63 selections of sunnhemp better nodulation was recorded during the vegetative phase and in 22 selections during the flowering phase of the crop. Of the 20 selections of greengram and blackgram, six in each contained more number of nodules per plant. Similarly out of 16 redgram and 12 bengalgram selections better nodulation was recorded in six and four selections respectively. These results indicated the variations in response for nodule formation in different germplasm collections.

Efficient rhizobial strains for different leguminous crops like groundnut, pulses, greenmanures and forage legumes were mass multiplied employing fermentor and about 50,000 packets of peat soil based rhizobial inoculants were supplied to the farmers in Tamil Nadu, Pondicherry and Kerala during the year 1975-76 to cover an area of 20,000 hectares.

R.1. Biol. 204 Studies on the microbial decomposition of organic matter in soil

D. Purushothaman and C. Kasirajan

The study of enrichment of compost with *Azotobacter* showed that mixing in *Azotobacter* cell suspension at 3 litre/cart load of compost enriched the well decomposed compost (0.268 per cent N) within a month as against 0.210 per cent N in the control.

Trials conducted in a farmer's field at Kuniamuthur employing peat soil based microbial cultured (containing thermophic) strains of *Penicillium* sp. *Aspergillus* sp. *Trichoderma* sp, *Arthrobacter* sp) showed that decomposition of farm wastes was better in nine months when compared with that of conventional method. It was found that in this even at 5' depth of the pit, the decomposition was good. In a trial at Sundakamuthur, composting of sugarcane trashes mixed with sewage effluents it was found that after a period eight months the compost had no smell, and showed slight increase in the N content.

R.1. Biol. 209 **Study of environmental pollution on plant systems**

G. Oblisami, C. Padmanabhan and G. Pathmanabhan

The effect of cement dust pollutants in the vicinity of cement factory at Madukkarai on CSH 5 sorghum was assessed in comparison with that of non-polluted fields. The starch content was significantly reduced in the grains from dust polluted samples (46.8 per cent) when compared to that of non-polluted samples (52.2 per cent). The protein content was not much altered due to cement dust pollution.

The effluent samples collected from M/S Seshasaye Paper Board factory, Pallipalayam were analysed and studied for their effect on the germination of different seeds, viz., paddy, cholam, maize, cotton and redgram. The effluent water affected the germination of the seeds from 20 to 90 per cent when compared to water control. The germination of paddy got reduced by 25-75 per cent; cholam by 10 to 90 per cent; maize 10 to 35 per cent; cotton by 5 to 85 per cent and redgram by 10 to 75 per cent.

R. 1. Biol. 210 Utilization of effluents from sago factories for growing microorgainsms

D. Purushothaman and C. Kasirajan

The analysis of the sago factory effluent water indicated the presence of acetic, butyric and propionic acids and voltile acids were also detected in the effluent. On storage, the titreable acidity increased gradually reaching a pH of 3.0. To remove the off flavour developing during the auto-fermenta tion of effluent water, the filtration through the porus earthern column (consisting of sand and gardenland soil) was attempted. It was found that effluent passing through the soil column was devoid of the bad odour and the pH being 6-2; this effluent did not have any adverse effect on the germination and growth of blackgram and greengram.

When supplemented the sago factory effluent with jaggery and ammonium sulphate, the native microflora (yeast and bacterial cells) multiplied and gave an yield of 7,5 g of biomass/litre of the effluent.

R. 1. Boil. 212 Studies on microbial (*Azotobacter*) activities in rice soils

D. Purushothaman and C. Kasirajan

Screening of different rice varieties for the colonization of *Azotobacter chroococcum* in the rhizosphere was carried out by sowing *Azotobacter* treated seeds into sterilized and nonsterilized soils under pot culture conditions. During the flowering stage of the crop more number of *Azotobacter* was recorded than the other stages. The varieties IR 20, Bhavani and TKM 6 in general harboured more number of *Azotobacter* than the other varieties. The seed inoculated *Azotobacter* cells survived well in sterile sink till the death ●f the death of the plants.

A field trial was conducted at the Regional Research Station, Bhavanisagar using *Azotobactar* on rice variety Co 38 (Amaravathi). When seed, seedling dipping and soil application of *Azotobacter* were given together with 50 per cent of the recommended N fertiliser level, the grain yield was on par with the yield obtained from 100 per cent of fertiliser N applied crop. In another trial at wetlands, Coimbatore with Bhavani variety of rice, it was found that *Azotobacter* treatment as seed, seedling dipping and soil application along with 50 per cent of recommended fertilizer N resulted in higher grain yield than the 100 per cent of the recommended dose of fertiliser N applied plots.

R. 1. Biol. 213 Studies on the effect of *Azotobacter* on various crops grown under different agro-climatic conditions
G. Oblisami and T. Natarajan

Field trial on the effect of *Azotobacter* on Vaigai variety (Co 37) of paddy was conducted during Rabi 1975 at Paddy Breeding Station, Coimbatore. Plant height and number of tillers did not vary significantly between *Azotobacter* treatment with varying levels of fertilizer N and no *Azotobacter* treatment. The treatments of Azotobacter with 80 and 90 kg N/ha gave more or less similar yield (6595 and 6510 kg/ha) which were on par with the yield of 6600 kg/ha in the treatment with 120 kg N/ha and without Azotobacter application. This has indicated that atleast 30 to 40 kg N/ha could be saved without affecting the grain yield.

Another trial during *kharif* 1975-76 season, on the effect of *Azotobecter* on paddy (RP-4-14 variety) in connection with other beneficial organisams like *Bacillus polymyxa* and *B. megatherium* along with varying levels of fertiliser N at the basel level was carried out at the Paddy Breeding Station, Coimbatore. *Azotobacter* along with 90 kg N/ha as fertiliser gave more or less similar grain yield (5050 kg N/ha) as that of the treatment with 120 kg N/ha alone (4990 kg/ha) when *Azotobacter* in connection with *B. polymyxa* and *B. magatherium* were applied to the crop along with 120 kg N/ha, the grain yield varied from 5070 to 5580 kg/ha with an increase by 80 to 590 kg/ha. These trials indicated the possibility of saving of fertilizer nitrogen and /or increase in grain yield due to *Azotobactre* treatment.

In field trials on Vaigai and Karuna varieties of paddy in the farmers holdings of Madurai district, the *Azotobacter* treatment with 75 per cent of fertilizer N gave the grain yield of 4875 kg/ha, respectively with a higher grain yield of 650 kg/ha and 50 kg/ha indicating the beneficial role of *Azotobacter* to paddy crop.

In a field trial the *Azotobacter* treatment by dipping of cuttings and soil application on sweet potato with varying levels of fertiliser N indicated *Azotobacter* treated plots gave higher yield of tuber. *Azotobacter* with

30kg N/ha of fertilizer N gave higher yield of tuber than the traatment with 40 kg/ha alone.

R. I. Biol. 104 Effect of pesticide on the physiological system of mammals
S. Sadasivam and P. Thenammai

Taking rat as the test animal, sub-acute toxicity of endrin was studied by feeding endrin mixed diet, daily for a period of 3 months. Changes in the level of biochemical contituents of blood as well as in the liver enzymes, were noticed in animals fed with 5 ppm and 10 ppm doses. Food consumption ratio was less in test animals. loss of weight was also noticed in all endrin fed rats. Fifty percent of test animals in 10 ppm dose died during the experimental period. Though 5 ppm level was found to be definitely toxic, it was not lethal.

R. 1. Biol. 208 Biochemical aspects of food grains in relation to protein content and their nutritive value
B. Thayumanavan and A. Manickam

The total soluble and insoluble protein contents of thirty five Taichung rice varieties have been estimated. The range of total protein content was between 8.24 and 12.28 per cent and that of soluble protein between 0.28 and 1.70 per cent. The variety T 972 had the lowest total protein (8.24 per cent) and T3 had the highest (12.28 per cent). The variety T 508 had the highest soluble protein content. Amino acid contents of CO 32 and its mutants have been analysed quantitatively. The mutant CO 32-20-69 had high lysine content while the mutant Co32-10-220 had high threonine content.

Polyacrylamide gel electrophorosis of Co 38, CO 39 and TNAU 658 showed the presence of eleven protein bands in each and a qualitative variation was observed in different protein fractions.

R. 1. Biol. 211 Assesment of the nutritive value of the South Indian diet
S. Sadasivam, S. Leelavathi and A. P. Shanthi

Compound meal analysis was done on the diet supplied in II year and III year B.Sc. (Ag.) students messes. The biochemical evaluation showed slight total calorific deficiency in both the diets, The dificiency of vitamin B1 in II year diet and the deficiency of vitamins B2 and C in III year mess diet were also noticed. Both vegetarian and non-vegetarian diets had more or less the same nutrients and calorific value. Inclusion of evening tea in the menu for the day and also the inclusion of fruits have been suggested to the Hostel to rectify the nutrient deficiency in the the diets.

R. 1. Biol. 215 (F.O) **Nutritive value of feeds and fodders with spcial reference to devising cheap poultry and animal feed substitutes**
D. Raj and S. Leelavathi

The proximate composition analyses of the wild legumes which are to be used as one of the ingredients to supply the protein need in the cheap poultry feed, were carried out. The selected wild legumes are *Acacia leucophloea, Bauhina, Clitoria ternatea, Caesalpinia* and *Gliricidia*. Out of these wild legumes *Clitorea ternatea* was found to be rich in crude protein, *Giricidia* in total carbohydrate and crude fibre and *Caesalpinla* in total ash and other extractives.

R. I. Biol. 216. (F. O.) Biochemical studies on the nitrogen fixation of *Pleurotus sajor-caju* (Fr) Singer
B. Thayumanavan and A. Manickam

To start with, the various bedding material such as straw, waste paper, maize cobs, wood shavings, *behndi* waste, papaya leaves and maize Cob sheath which were employed to grow *Pleurotus sajor-caju* (Fr) singer were analysed for their proximate composition at the initial and final stages. The protein content of the various bedding materials increased considerably whereas the cellulose content decreased due to *pleurotus* growth.

R. 2. Biol. 106 Studies on the fermentation of various grape varieties of Tamil Nadu
M. Rangarajan and P. Muthukrishnan

Four different varieties of grapes were scored for their suitability for fermentation employing the Mysore strain of *Saccharomyces cerevisiae*. The parameters used for scoring were changes in the brix, pH, multiplication of yeasts, total period taken for the completion of fermentation and alchol production. Based on the results obtained it was observed that both Muscat and Thompson seedless favoured the multiplication of yeasts very rapidly reducing the brix thereby producing more alchol in lesser period of time than other two varieties. Therefore they were scored for their suitability for fermentation in the following order.

Muscat > Thompson seedless > Bangalore Blue > Anab-e- shahi.

R. 2. Biol. 206 Investigation on the nature and extent of contamination of aflatoxin on various food stuffs
M. Rangarajan and P. Murhukrishnan

Comonly used food stuffs such as bengalgram flour and maida and animal feeds such as groundnut cake meal and mixed meal were analysed for aflatoxin producing fungi. The results revealed that all the materials examined were found to be contaminated with *Aapergillus flavus, A. niger* species of *Aspergillus, Penicillium* and several other fungi. Among the various fungi

isolated, *A. flavus* was found to be predominant. Among the materials examined, mixed meal which was used as a poultry feed, was found to be heavily contaminated with *A.flavus* (78.1%)

Therefore, detailed *in vitro* studies were conducted with *A. flavus* isolated from mixed meal for its capacity to produce aflatoxin. The culture was compared with two other potential toxigenic strains Viz., *A. flavus* (NIN. 232) and *A. parasiticus* (NRRL 2999) by growing them in Adye and Matel medium. The culture filtrates were analysed for the presence of aflatoxin using thin layer chromotography method. The results revealed that *A. flavus* from mixed meal was found to produce B1, B2, G1. and G2 similar to that of *A. parasiticus* (NRRL 2990) although the isolate resembled *A. flavus* (NIN 232) in conidial characters.

R. 2. Biol. 207 Studies on the efficiency of *Azotodacter* sp., in the improvement of soil

M. Rangarajan and P. Muthukrishnan

The efficiency of *A. chroococcum* with various levels of nitrogen in improving the yield of Kannagi variety of paddy was studied. The results showed that the *Azotobacter* applications through the seed, seedling and soil increased the growth and yield of paddy. *Azotobacter* when applied in combination with half the recommended level of nitrogen per hectare gave the yield of 7150 kg grains per hectare and statistcally on par with the treatment which received full dose of nitrogen that gave the yield of 7210kg grains per hectare. The results of the experiment reveal that application of Rs. 40/- worth of peat based *Azotobacter* culture per hectare saved 30 kg of nitrogen per hectare to be applied in form of urea, besides increasing the grain yield per hectare.

R. 2. Biol. 208 Study of mechanism of sex expression in *Memordica charantia*. L. and *Trichosanthes anguina*. L. and to explore the possibilities for increasing the female flowers by hormones and chemicals

Girija Balasubramanyam and J. Venkatakrishnan

Seedlings of two bitter gourd varieties viz., green and White were sprayed with hormones viz., Ethrel, GA, TIBA and NAA in the concentrations of 50, 100 and 150ppm. Improvement in the percentage of female flowers was observed in the plants treated with NAA 50ppm (9.2%), 100ppm (8.1%), 150ppm (7.7%), GA 100 ppm (8.9%), and Ethrel 150ppm (5.9%) over control (2.4%). The spraying of Ethrel 150 ppm and TIBA 50 ppm have recorded the highest yields (507 and 348 g/vine) followed by NAA 150 ppm (288 g/vine), GA 100 ppm (201 g/vine) and NAA 50 ppm (190 g/vine) over control (120 g/vine).

The data show that there is a relationship between the improvement in the sex ratio and the yields obtained in the plants sprayed with Ethrel 150 ppm, NAA 50, 100 and 150 ppm and GA 100 ppm which have recorded considerable improvement in the sex ratio resulting in high yields.

17. PHYSICAL SCIENCES

R. 1. Phy. Sci. 201 Biometrical genetics of crops
C. Suyambulingam and W. Jebarani

Work on the identification of different components which contributed towards the yield showed that in the medium duration rice, panicle weight and number of tillers contributed significantly to yield where as the fineness of grain was negatively correlated to yield. In the long duration varieties, number of tillers, height and shape of the panicle contributed more towards the yield. In the short duration rice the pooled analysis of dwarf and tall it was found that the height alone contribute slightly towards the yield where as the awned property contributed significantly negative to the yield.

R. 1. Phy. Sci. 202 Utilization of multivariate techniques in yield component analysis for choosing parental combination in hybridization programmes for yield improvement in *ragi*
K. Bose and W. Jebarani

The multivariate analysis for the medium, long and short duration varieties of *ragi* revealed the following. In medium duration, the number of tillers alone contributed significantly for the yield. In short duration varieties, the contribution of tillers was highly significant whereas, the number of fingers, paniclesand panicle length showed negatively to the yield. In the long duration the number of panicles contributed more for the yield whereas, the number of fingers and height showed negative correlation.

R. 1. Phy. Sci. 203 Effect of plant growth on structure of soils
S. Parthasarathy, N. Arunachalam and K. P. Rajendran

Changes in physical properties of red soil treated with press mud and grown with Bengal gram improved the water holding capacity, percentage of pore space of the soil. Soil+presmud+crop treatment appeared to be better than soil+crop.

Changes in physical properties of red soil treated with farmyard manure and grown with greengram increased the water holding capacity and percenttage of pore space of the soil.

R. 1. Phy. Sci. 204 Studies on the physical properties of plants and plant surfaces and how the deposition of dust and their pollutants affect the plant
S. Parthasarathy, N. Arunachalam and K. P. Rajendran

Two fields around A.C. Cement factory, Madukkarai grown with CSH. 5 sorghum were taken for the study of dust pollution. One of them was continuousy deposited with cement dust and the other was free from dust. The

plant parameters were collected. The analysis revealed that there was changes in height of the plant, diameter of nodes length of the earhead, internode distance and the angle of leaves in cement dusted field. There was no change in the breadth and number of leaves and the circumference of earhead. The crop appeared to have better morphological features in the undeposited field.

The soil samples from dust deposited were collected for analysis of their physical properties. Waterholding capacity decreased upto the depth 4.5 cms. This may be attributed to the cement dust deposition. However there was not much difference in the percentage of pore space of the soil.

R. 1. Phy. Sci. 206 Studies on industrial wastes and their utilisation
T. Radhakrishnan, C. Devarajan and P. Singaram

The blackmatti of sulphur collected from South India Viscose Rayon Factory. Sirumugai was tested as an insecticide for the control of redmite on Jasmine, groundnut and bhendi. In Jasmine the redmites were completely controlled. The percentage reduction of mites population ranged from 84 to 87.5 per cent in groundnut and 25 to 50 per cent in *bhendi*.

R. 1. Phy. Sci. 207 Standardisation of extraction and estimation of essential oil from flowers
M. Indira Raja, L. Devarajan and P. Singaram

Edward Rose *(Rose bourboriana)* flower petals were extracted with the solvent, hexane. The yield of concrete was 0.272 per cent weight of the flower petals, The extraction of the 'concrete' yielded a dark brown 'absolute' of 0.122 per cent by weight of the flower petals and 44.66 per cent by weight of the concrete.

Flower petals of *Mellingtonia hortensis* (*Maramalli*) were extracted with the solvent, hexane and the yield of concrete was 0.22 per cent by weight of the flower petals.

R. 2. Phy. Sci. 101 Studies on thermal properties of soils with reference to soil temperature variants
T. R. Lakshminarayanan

Determination of specific heat and thermal conductivity were made on farm soils of different texture.

The data indicated that the specific heat of soils increased with increase in temperature and clayey soils were found to have the highest specific heat of 0.334 at 40° C. The thermal conductivity of soil increased with increase in sand contents.

18. SOCIAL SCIENCES

R. 1. Soc. Sci. 271 A study of socio-economic changes in farming families cultivating such horticultural crops like banana, vegetables, flowers and grapes
N. Ravindran and R. Venkatachalam

A study was undertaken with a view to finding out socia-economic changes among grapes-growing families in Coimbatore district. The respondents are aware of the advantages of improved practices. Inter-cropping is popular (29.9 per cent) soil-testing for general and specific purpose is being got done. Adoption of farm technology is on the increase with use of tract-tors (16.6 per cent); electric pump-sets (100 per cent) iron plough (69.9 per cent); bundformer (49.9 per cent) and hand operated sprayers (59.9 per cent) As grapes are produced for market, farmers show willingness to adopt improved techniques to reduce cost of production.

Cultivation of grapes for more than twenty years have given them good economic returns. They make a net profit upto Rs. 10.000/- This has induced certain social changes; predcminance of farm-house living (46.6 per cent) and pucca and semi-pucca houses (100 per cent); preference for allopathy (100 per cent) and private hospitals (100 per cent) changes in dress and fashion; synthetic dress (96.7 percent) and pressed cloths (100 per cent); institutional participation (39.9 per cent) wide travel covering one state (43.2 per cent); two states (3.3 per cent) and covering three states (9.9 per cent); wider recreational activities such as possession of radio-sets (100 per cent); purchasing of dailies (77.9 per cent) and weeklies (85.5 per cent) visiting cine-houses (26.6 per cent); banking habits (100 per cent); possession of cycle (100 per cent motor cycles/scooter (43.2 per cent) and car (46.6 per cent). Hundred per cent of farmers admitted economic motivation in the cultivation of grapes and 6.6 per cent would increase extent of cultivation of grapes. There is a change in attitude towards family planning, inter-caste marriages, status of women, political democracy and space-exploration. Farm–decision is made by head of family who wields enormous power and influence on family members, whether joint or unitary family. Structure of rural family is changing from joint to unitary (69. 9 per cent). There is rise in marriage of male and female - 25 and 19 years respectively. All of them own land their chief hereditary occupation in agriculture. The families spend liberally on rituals. The data relating to farmers cultivating flowers, banana and vegetable had been puplished in the previous years' annual reports.

R. 1. Soc. Sci. 203 A study of sociological inplication of off farm migration of labour
S. Subramanian, N. Ravindran and R. Venkatachalam

This study was conducted to find out the socio-psychological reason for migration of farmers and farm labour and their attitude towards agriculture

and industry. Samples were drawn from 8 textile mills in Coimbatore and Singanallur areas. A attitude scale was developed to study the attitude of migrants towards agriculture and industry.

The study shows that 66.6 per cent of the migrants left their village before 25 years of age. Thirty nine per cent of the respondents were illiterate and other were educated upto primary (47.2 per cent) and secondary levels (13.8 per cent) Lack of assured irrigation for agriculture was the main cause for migration (77.6 per cent). Conventional socio-psychological causes of migration have been found to be not significant; inadequate land for culti vation (12.8 per cent), low wage-income in agriculture (6.4 per cent) and problems in joint family (3.2 per cent) had been only minor reason for the migration. As regards landless agriculturral labourers, inadequate wage was the sole cause for their migration. Majority of migrants (52.7 per cent) were from joint families having a large size of 7 members or more. They had more number of dependents in the new setting; 69.4 per cent of them had 4 or more dependents.

Among the respondents, 36.4 per cent had land above 4 acres but below 5 acres; 16.6 percent possessed land above 3 but below 4 acres; 5.6 per cent had land above 2 but below 3 acres; 25 per cent possessed l and below 2 acres. and 16.4 per cent were landless.

They had higher income in the present occupation, compared to their income in agriculture before their migration. They enjoy savings in the form of provident fund, life insurance and national small savings. They have incurred debts for children's education, house-construction, etc., Only 16.6 per cent of the migrants are found to be free from debts. Migrants (47.3 per cent) had purchased property such as house, house-site and land.

Just 41.5 per cent want to continue in town while 58.5 per cent like to return to villages despite living in towns for about 15 years and more. Seventy per cent of the migrants had favourable attitude towards agriculture.

Lack of opportunities in villages pushes them to cities where they find themselves in over-crowded surroundings with uncertain employment and a money wage insufficient to cover the high cost of urban living.

R.2. Soc. Sci. 204 Social change among Banana cultivators in Madurai district

M. Lakshmana Singh and U. R. Kaliappan

Thiruvadagam village in Vadipatti Union and Thuvariman village in Thiruparankuntram Union were selected for this study based on a high percentage of farmers cultivating banana. By using random sampling technique 84 farmers (42 from the farmer and 42 from the later) were selected and interviewed. They were broadly grouped on the basis of land holding into submarginal (0.004 to 0.6 hectare), small (0.6 to 1.21), medium (1.21 to 2.42) and big (2.43 and above) farmers. There were 10 submarginal farmers with

an average of 0.42 hectares, 33 small farmers with 1.01 hectare, 26 medium farmers with 1.80 hectare and 16 big farmers with 3.27 hectares of land per head.

On an average submarginal farmers spent Rs. 2240 per hectare to cultivate banana. The same was Rs. 4330 among small, Rs. 6420 among medium and Rs. 4280 among big farmers. The farmers obtained a profit of Rs. 4940 per hectare despite the droughty conditions and consequent heavy expenditure on irrigation.

Only 25.4 per cent of the credit needs of the farmers have been met by Co-operatives and banks. As high as 74.6 per cent of the credit needs were locally managed through private sources. The rate of interest for this form of local non-institutional credit varied from 12 per cent to 36 per cent per annum and in some cases from 3 bags of paddy (65 kg per bag) to 5 bags of paddy per 1000 rupees per annum.

Considerable degree of progress has been made in education. From the educational level of the father and mother the educational progress of sons and daughters was calculated. For this purpose illiterates, primary level, secondary level collegiate and professional diploma level and post-graduate and professional degree level were considered as stages of education. For each stage of mobility of the children one score was given taking the levels of education of the parents as zero. The over all mobility score was 1.29. The same was high among the rich (1.64) followed by submarginal (1.58), medium (1.24) and small (1.00) farmers.

Among the banana cultivators, during the last five years the major items of expenditure were on marriages, deaths and births, followed by investment on land, house building and education.

19. LANGUAGES

R.I. Lang. 206 A study relating to Water, water management practices and meterology as revealed in Sangam and other Tamil literatures

L. S. Kandaswamy and M. Abdul Rahim

The study was undertaken to collect materials relating to irrigation, rain, water management practices, etc. as presented directly, and revealed indirectly in Tamil literature for codification and for developing insights applicable to agriculture. It has been found that there were watchmen to keep the banks of the ponds in good repair, and to big new canals and ponds for storing the rain waters and the waters which may overlow from the ponds. In Kongu Nadu (comprising of Coimbatore, Salem and Western parts of Madurai Districts) deep wells to a depth of even 200' have been dug with chisels. It is reported that farmers were able to forecast rains by looking at the type of clouds that passed over their places.

R.I. Lang. 208 A continuous study of the developing competency (quantified) in English of the students of B. Sc. (Ag.) (Hort.), B. E. (Ag.) from the first year to the last year of their course in relation to their socio-economic-educational background

R. Sundarsanam and B. Ponnuswamy

The study has been undertaken to evaluate the incremental competency of the students of Agriculture, Horticulture and Agricultural Engineering in handling English as a tool for one's development in his field of study from the first year to the last year of his stay in the College by means of suitable test-papers.

The mean score of students with low and high socio-economic and educational background at the time of entry into the college are respectively 48.30 and 59.30 being significant at 1 per cent level. The mean score of students from Government High Schools is 38.20 as against 45.34 of students from denominational high schools. The mean scores of students from Governments Arts Colleges is 40.5 as against 49.67 of the students from private colleges. Further studies are in progress.

R.1. Lang. 211 A comprehensive linguistic study of the oral and written communication of the scientists in Tamil by print, Air and T. V. for purposes of formal education and extension education

R. Sudarsanam and B. Kumaravadivelu

About 20 class room lectures in Tamil in science subjects (Zoology, Botany, Chemistry and Physics) in I, II and final year B. Sc. degree classes in Government Arts College, Coimbatore have been recorded, these lectures have been analysed in terms of linguistic components vis-a-vis their reception by students (sample : 200).

Class room communication by science lectures in the medium of Tamil appears to fail owing to misleading translations of technical terms and the habit of the teachers to think in English and translate it into Tamil inspite of the fact that Tamil is their mother tongue. As a result of this, the lectures are sketchy with few logical and analogical connections. They fail to develop logical expectancies in the students and so there is no cogent exposition. Information-load is not widely spread and they do not clearly demark specific stages of developments, emphasize the key words or denote the semantic range of technical words even in areas where two or more scientific disciplines overlap.

Three sessions of training programmes by the extension personnel of Farmers training Centre, Coimbatore, to select group of farmers (about 100) were recorded and the lectures analysed linguistically. About 20 randomly selected farm-broadcasts representing different modes (straight talks, questions answers, etc.) have been recorded and analysed. On the basis of these studies,

a model for linguistic programming of the message for communication in relation to the audience and the purpose of communication, and a schedule for revising and editing a script linguistically for written and oral communication have been developed; these are available for use.

20. FISHERY SCIENCE

R. 1. Fish. 201 Utility of sewage effluents in fish culture
V. Natarajan and K. Venkataramanujam

Two dug-out earthern ponds of 130 m^2 were used for composite culture of fish using sewage as fertilizer being diluted at 1:5 ratio with ground water. The stocking rate was 10000 kg/ha and the species stocked were catla, mrigal, common carp, milkfish, rohu and silver carp during July 1975. Sampling conducted in December '75 indicated fish production ranging from 6828 kg-8496 Kg/ha per annum. Raw sewage used thus as an aquatic fertilizer has great potential in enhancing fish production.

R. 1. Fish. 203 Survival, growth and yield of carp hatchings
V. Natarajan and K. Venkataramanujam

Fish rearing in groundlevel circular cement cisterns of 113m^2 area with no manuring and only supplementary feeding with rice bran and groundnut oil cake gave production of 2057 kg/ha per annum with species combination of calbasu, mrigal and *Labeo fimbriatus*, while production under identical conditions with species combination of catla, rohu and the common carp was only 1172 kg/ha per annum.

Composite culture done in Bhavanisagar gave fish production of 2250 kg/ha per annum with survival upto 95 per cent.

R. I. Fish. 208 Culture of giant gouramy
V. Ramachandra Menon and Sanjeevi raj

This project started in October 1974 was continued and the gouramy were fed with vegetables refuse and oil cakes. They however, attained only a length ranging from 210-220 mm and average weight of 200 grams. They remained free from parasitic attack

R. I. Fish. 209 Culture of the river catfish
V. Ramachandra Menon add Sanjeeviraj

85 catfish of 120-280 mm sizes and 60-80 g weight were kept in a cement cistern and fed with chopped fish. Dry pelletised feed was also tried on a few. The response to artificial feeding was poor and the stock remained without any increment in weight. Slaughter-house refuse was also tried as catfish feed.

21. ANIMAL HUSBANDRY

R. I. A. H. 207 Studies on gastro-intestinal helminth parasites of sheep of and goats–I. Systematic survey and incidence
D. Jeyaseelan Chellappa

So far 23 entrails (of sheep and goats) were examined parasitologically. All showed multiple infections with different species of parasites. On the whole, 8 species of Nematodes, 2 of trematodes 2 of cestodes were encountered. Further analysis of the parasite collections is in progress.

The observations clearly indicate, that the parasites encountered are not only dangerous in nature but their intensity is by far injurious, and as such a definite threat to sheep and goat production in Tamil Nadu. Routine deworming of sheep and goat is a must to avoid this intangible losses due to parasites.

R. I. A. H. 215 Development of Turkey Unit – Study of economic traits in turkeys under existing local conditions
C. A. Gopalakrishnan and D. J. Chellapa

With the chief objective of studying the genetic parameters in respect of the economic traits in Turkeys, turkey birds available in local markets were purchased and were used as the material for study.

The above study indicates that a small unit of one male with 6 to 8 female can be reared by farmers or others. The foraging capasity and insectivorous habit of the birds can be exploited to the maximum to cut down expenditure on feed. Broody hens of the country bird were found to be useful for hatching the turkey eggs. They nurse the young poults well and serve as good natural brooders. Feeding the young poults with boiled eggs (one per 4 to 6 poults) and antibiotics in feed or water minimises the risk of disease. The adult at least upto 2 years did not show any disease.

R. I. A. H. 218 Evaluation of Breeding and Reproductive performance of three different categories of dairy herds viz., Sindi, Crossbred, Local cows x Jersny bulls,
C. A. Gopalakiishnan, M. Mookkappan and L. Dhamothiran

An evaluation of breeding and reproductive performance of three different categories of dairy herds viz. Sindhi, Crossbred, Local cows x Jersey bulls, only 14 sindhi cows and 14 crossbred cows were selected for the study. Among the sindhi herd and crossbred cows selected the average age at first calving, the first lactation period and first dry period are 37.3 months, 35.7 months, 323 days, 285 days and 214 days, 161 days in Sindhi and cross breed respectively.

R. 1. A. H. 219 **Evolving Hybrid White Leghorn for increased egg production**

N. Krishnamurthi and B. Kather Khan

The following traits of the base population of V and M strain are quite encouraging.

Traits	V strain	M strain
1. Average weight of eggs (gm)	47.55	45.57
2. Average hatch wejght of chicks (gm)	34.637	32.750
3. Average weight at 20 weeks (kg)	1.192	1.171
4. Average weight at maturity (kg)	1.528	1.362
5. Age at maturity (days)	170.2	164.6
6. Egg production upto 72 weeks	223.8	236.7

Poults and Cockerels were selected based on the performance of the parent hens which have given over 200 eggs based on the hen day production for 72 weeks.

R. 2. A. H. 204 Studies on evolving an economic ration for poultry

V. Kathaperumal

In the feeding trial on chicks of 0-8 weeks old it was found that instead of conventional addition of groundnut cake at 30 per cent level in the feed mash, replacing it with 5, 10 and 15 per cent coconut cake was found to be on par with ration containing groundnut cake alone. Addition of 5, 10 and 15 per cent of gingely oil cake and sunflower oil cake was not found to give growth rate on par with the mash containing groundnut cake alone.

In a study on the growth performance of pullets (8-18 weeks old) by sustituting maize in the feed with deoiled rcce bran 20, 30, 35 and 40 per cent there was no significant difference in the weight grain and in feed consumption. De oiled rice bran contains 16 per cent protein and is also cheaper than maize costing about Rs. 500/-per ton only while the cost of maize ranged from Rs. 1000/- to Rs. 1500/-per ton and contains 9 per cent protein only.

R. 2. A. H. 206 Studies on the effect of pesticide residues on livestock

P. Sadsivam

The effect of pesticide residues on livestock was studied. Ragi seeds treated with D.D.T. 5% Parathion 5% dust and Malathion 5% dust (1 g pesticide for 1 kg of grain) were fed to broiler chicks for a period of 50 days. The composition of mash contained ragi grain 65 parts, groundnut oil cake 25 parts, fish meal 8 parts and mineral mixture 2 parts. In an out break of coccidiosis incidence, birds fed with ragi treated with malathion suffered most

indicating predisposition of the birds to the disease. This agrees with earlier report wherein the chicks fed with malathion and parathion treated maize were affected with coccidiosis.

The effect of six different insecticides in the control of lice infestation *Menopon galliane* and *Menocanthus straimneus* was studied. All the chemicals viz., sumithion (0.05 % dip) malathion (0.05 % dip), morestan (0.5% dip), carbaryl (0.05% dip), dalf dust (dust) and dipterax (dust) were effective against the louse eradication and the residual effect lasted for 6 weeks. The cost of delousing of 100 birds with sumithion, malathion, more-ston, carbarly dalf dust, dipterex was Rs. 4.50, 5.50, 9.15, 11.70, 19.00 and 6.50 respectively. Dipterex has the advantage of cheapness and being a dust can be used in cloudy and rainy weather. Toxicity manifestations were not noticed with any of the insecticides tested.

5. EXTENSION EDUCATION

The Directorate of Extension Education is making all efforts to help the farmers of the State in collaboration with the State Department of Agriculture, All India Radio and the Press by disseminating results of research. It serves as an important link between the research workers of the University on the one hand and the extension workers of the State Government and the farmers of Tamil Nadu on the other, and forges free interaction between them. The communication Centre and the farmers' Training Centre at the main campus, the Farmers' Training Centre and the National Demonstration Scheme at the Madurai campus, and the two Farm Advisory Councils at Coimbatore and Madurai are engaged in carrying out extension education activities of the University.

1. Training Programmes

The Directorate of Extension Education organised a training programme for 36 Deputy Agricultural Officers on January 16, 1975 in collaboration with the Department of Agricultural Economics on collection of data for programming Agricultural Development. An inservice refresher training to 40 Technical Officers (Agriculture) of the State Bank of India was conducted from July 1 to 3, 1975. A training on Azatobactor inoculation of crops was conducted at the Department of Biology on July 14 and 15, 1975. for a batch of 8 District Agricultural Officers (Agronomy) of the State Department of Agriculture. Second inservice refresher programme for 55 Technical Officers (Agriculture) of the State Bank of India was conducted on July 28, 1975.

Two weeks Agriculture Training was given to 10 I.A.S. Probationers from August 16 to 29, 1975. The Department of Horticulture conducted a training programme for 7 Assistant Horticulturists of the Agriculture Department on Mango pruning for one day at Vettaikaranpudur of Pollachi Taluk during August 1975. Nine Probationary Deputy Collectors underwent training for a period of 8 days from December 27, 1975 to January 3, 1976.

2 The main activities of the the Farmers' Training Centres at Coimbatore and Madurai are furnished below

a) Farm Advisory Council: The Farm Advisory Councils at Coimbatore and Madurai played an important role during the year and tackled the following problems of the farmers. (i) Poor yield and growth of grapevine at Angalakurichi-, Vettaikaranpudur, Salaiyur and Kaniyur, (ii) Poor growth of

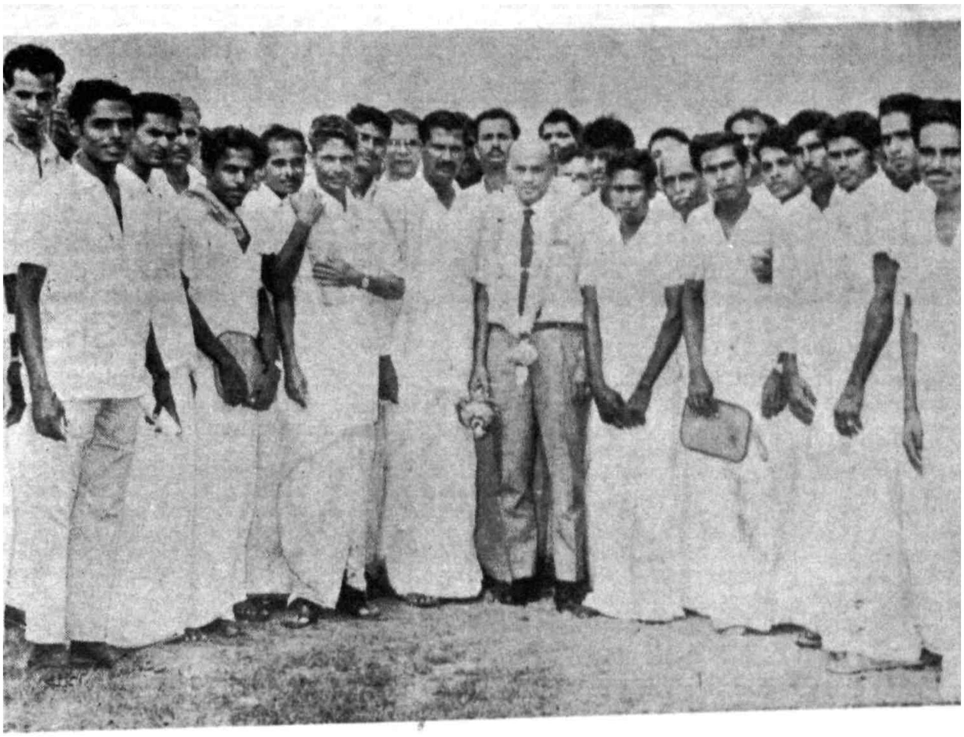
IR 20, (iii) Sudden decline of yield of jasmine, (iv) Failure of *ragi* in certain pockets of Cuddalore. (v) Wilt disease in betelvine in Trichy and Madurai districts, (vi) Non flowering of paddy in Salem district, (vii) Sudden drying up of cotton in Coimbatore district, (viii) Sudden spread to tobacco disease in Sulur area, (ix) Poor growth of CBS 156 cotton in Sathyamangalam, (x) Poor conditions of poultry birds, (xi) Cessation of teriminal bud and irregular shape of leaves in cotton, (xii) Reduced productivity of vegetable crops in saline soil, (xiii) Defective soil conditions for raising paddy crop, (xiv) Cross bread calves not conceiving, (xv) Scorching of paddy due to wrong method of weedicide application, (xvi) Decline in guava yield, (xvii) Non-bearing of Pairi mango trees, (xviii) Nematode attack on crossandra, (xix) Red-hairy caterpillar attack on groundnut and control by Nuclear Polyhedrosis, (xx) Newly reclaimed lands giving poor yields, (xxi) Kerala wilt on coconut, (xxii) Lesion nematode on grapevide (xxiii) Magnesium deficiency in MCU 5 cotton, and (xxiv) Die-black disease of chillies.

(b) Institutional Training: with the active support of the various Departments of the Tamil Nadu Agricultural University, the Farmers' Training Centres conducted Institutional Training camps comprising of short courses with a duration of 4 days.

Intensive training in cultivation of High Yielding varieties of crops along with their package of practices was imparted to farmers employing a cross media approach consisting of lectures, discussions, demonstrations, talk with slides, film shows and field trips, The modern agronomic practices such as proper season, use of optimum seed rate, seed treatment, placement of fertilisers, weed control and water management etc. were explained in detail by suitable method demonstrations. Maintenance of milch cows, poultry keeping, storage of grain, rat control, preparation of compost, preparation of recipe with high yielding varieties of paddy, *cholam, cumbu, ragi* maize, and pulses and nutritive value of food, were the topics discussed.

The Coimbatore Centre conducted 20 Institutional Training camps, ten for men farmers and ten for women farmers benefiting about 293 men farmers and 262 women farmers. At Madurai centre, 17 camps were conducted benefiting 188 men farmers and 217 women farmers.

(c) Peripatetic Training camps: Production-cum-demosntration camps (one day camps) were conducted in the holdings of farmers with special emphasis on varietal, cultutal and pesticide demonstrations on high yielding varieties of crops. During the year, Coimbatore centre organised 129 demonstration camps and thereby benefitting 1775 farmers, and at Madurai 70 camps were conducted.



Reception to Vice-Chancellor by the Discussion Group Convenors of the F. T. C. Coimbatore

Demonstration in Soil Sampling at I. T. Camp in Andipatti Block by F. T. C. Madurai.

Sri Lanka Hockey players being introduced to our Vice-Chancellor

(d) **Farmers Discussion Groups :** These voluntary organisations plays an important role in disseminating the agricultural innovations in rural areas. The farmer's Training Centers assisted these groups by supplying technical bulletins from time to time, answering querries through correspondence and personal contacts. The Coimbatore Centre conducted seven trainings for the convenors of the Farmers Discussion Groups. The aim of this training was to make them function as effective voluntary leaders to educate the farming community in the modern agricultural technology. At Coimbatore centre, 39 new groups were found during this year. At Madurai centre, separate discussion groups had been formed for farmers and farm women and 377 and 300 Discussion Groups are now functioning respectively.

In order to create and promote a spirit of competition among the convenors of the Farmers Discussion Group, prizes were awarded in the form of Transistors to the best five convenors at the Coimbatore Centre. During this year, three prizes for men and two prizes for women were awarded. The prizes were distributed by the Vice-Chancellor during the convenors training.

(e) **Pre-seasonal training :** One day pre-seasonal camps were organised and conducted in 24 different places and 1010 farmers benifitted at Coimbatore centre. This type of training intensified the spread of dissemination of knowledge to the farming community. Eight pre-seasonal training camps were conducted at Madurai centre benefiting 180 farmers.

(f) **Seminars and village meetings :** 11 seminars were conducted at Coimbatore centre on paddy, millets, cotton, groundnut etc. involving the experts of Tamil Nadu Agricultural University, Departmental personnel and farmers and thereby 810 farmers were benifitted. 7 seminars were conducted at Madurai Centre benefitting 600 farmers. 14 village mettings were organised and 685 farmers were involved in the meetings at Coimbatore Centre.

(g) **Functional Literacy Programme :** It is an integral part of the programme of the Farmers' Training centre. The trainers of Functional Literacy Group from the Department of Education were trained on Agricultural aspect to promote literacy level among the illiterate farmers. 29 trainers from Madukkarai and Perur Panchayat Unions participated in the training.

(h) **Information Support :** The Coimbatore centre continued to publish the Tamil Journal *"Kalanjiam"* and distributed to the convenors free of cost. At Madurai centre the monthly Tamil Journal *"Ulavar Madal"* was continued to be printed and distributed to the convenors of Discussion Groups and other farmers.

(i) **Farmers' Training Centre as field laboratory to students :** The two Farmers' Training Centres served as field laboratory to the students of the Agricultural Colleges. In Peripatetic Demonstration camps and Institutional Training Camps organised by the Farmers, Training Centres, students

were given opportunity to address the farmers and conducted method demonstrations on various improved practices.

This involvement enabled the students to gain through field orientation in extension activities and to devolop confidence in them to face the farming community. This method of approach has been enthusiastically received both by the students and the farmers.

(j) **Campaigns** : The Farmers Training Centre, Coimbatore and Madurai have organised 3 and 6 campaigns respectively on plant protection and fertilizer application.

3. National Demonstrations

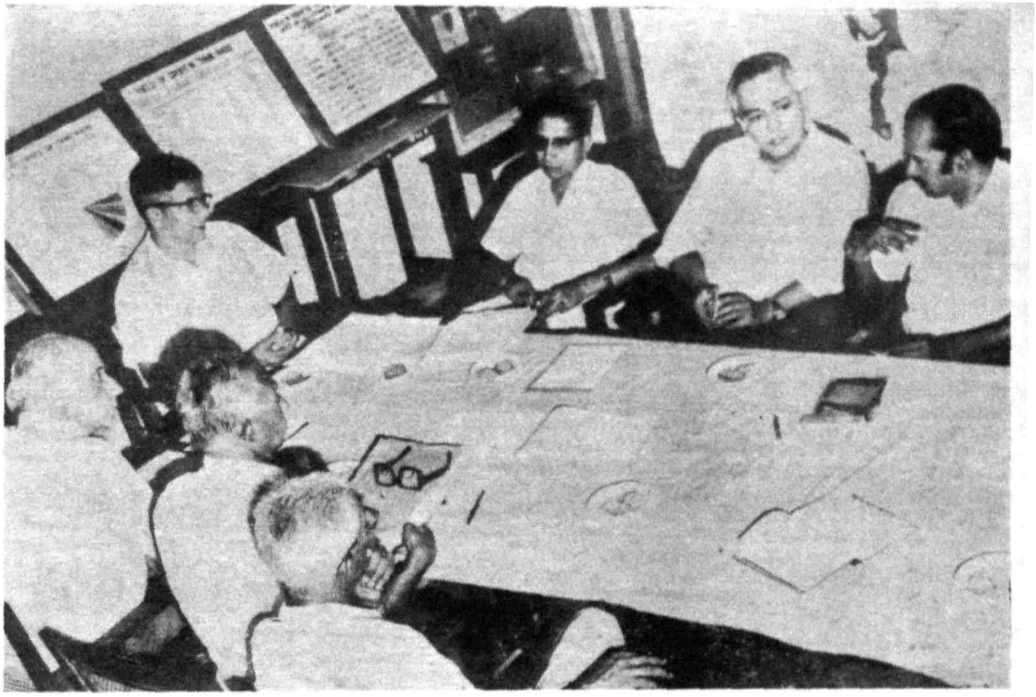
The aim of National Demonstration Scheme is to bring the Scientists and the farmers close to each other. This first line demonstration is to demonstrate to farmers the production potentialities of every unit area of land by using high yielding varieties of crops and adopting a multiple cropping programme and package of practices such as balanced use of fertilizers, effective water management techniques, plant protection measures and other agronomic practices.

During this year (1975-76), National Demonstration Scheme was continued under the auspices of the Tamil Nadu Agricultural University at Madurai.

There were 25 National Demonstrations conducted during the year involving three crop sequence in 7, two crop sequence in 16 one crop sequence in and one on a special soil problem. These demonstrations created a striking impression on the farmers about the yield potentialities of crops. The demonstration also provided an opportunity for the scientists to know the limitations of the technique and the field problems which affect crop production. The performance of pre-release varieties of crops from the Tamil Nadu Agricultural University has also been studied under the scheme.

Paddy crop dominated in all the demonstrations since it is the pivotal crop in the district. The harvest of different varieties of paddy in the first crop season has shown that IR. 8 was superior than the other varieties tested. IR 8 gave the maximum yield of 9,292 kg/ha followed by Vaigai 7,706 kg/ha, Karuna 7114 kg/ha and IR. 20 6,718 kg/ha. The second crop of IR. 20 paddy has been planted and demonstrations are in progress.

Demonstration trails on pre-release varieties of rice, pulses, *cholam cumbu* and *ragi* and inter-cropping. *Cholam* with pulses were laid out to find out their suitability for the various crop rotations that would fetch higher return.



FAO Consultants with the Director of Extension i/c, May 23, 1975

Our Vice-Chancellor, inaugurating the demonstration of J. K. Sato Power-Tiller
June 30, 1975

Farmers' Day Celebration at the TNAU Coimbatore, January 4, 1976

Field visit during Farmers' Day celebration, January 4, 1976

4. Miscellaneous

(a) **Farmers' Day** : The Fourth Annual Farmers' Day was celebrated at the main campus on January 4, 1976. Over 1000 farmers (men and women) from all over the State attended the Farmers' Day. In the forenoon, the farmers were taken round the various Departments and crop breeding stations. In the function held at the Anna Auditorium in the afternoon, 25 farmers from various districts took part in the discussion and posed many questions. Dr. G. Rangaswami. Vice-Chancellor presided over the discussion. Thiru Nathuram Mirdha, Chairman, National Commission on Agriculture, New Delhi and Thiru A. Venkatraman, Director of Agriculture spoke on the occasion. Dr. S. Jayaraj, Director of Extension Education replied to the questions of the farmers.

The Farmers' Day at the Madurai campus was celebrated on February 18, 1976 when Thiru U. S. Natarajan. Collector of Madurai District and Thiru. R. Natarajan, Special Secretary (Agri.), Government of Tamil Nadu participated.

(b) **Field Day** : Field Day were celebrated in 27 places in Madurai distrit and 1526 farmers attended.

(c) **Seed Sales Depots** : The University Seeds Sales Depots at Coimbatore, Madurai and other research stations distributed to the farmers quality seeds of several improved crop varieties and potted plants and seedlings. Leaflets and bulletins on improved farm practices for different crops and on Animal Husbandry were also sold in the Depots.

The details of the quantities of seeds, number of potted plants and seedlings sold are furnished in Appendix-VI.

(d) **Enquiries answered** : Questions and problems received from the farmers of Tamil Nadu were answered and solutions given. Convincing answers were communicated to the farmers directly and through mass media. Besides, the University Communication Centre continued to assist the All India Radio, Coimbatore with answers for the questions of the farmers for broadcast on Tuesdays, Fridays and Sundays of every week for 15 to 20 minutes.

(e) **Release of information to the Press** : The research findings of the different Departments and Research Stations of the University were processed and released by the Communication Centre as popular articles in English and Tamil to Dailies and journals for the benefit of the farming community in Tamil Nadu. The list of popular articles published in the year is given in the Appendix-VII.

(f) **Release of Information to All India Radio:** The Communication Centre released news on the research findings and activities of the University through the Farm and Home Units of the All India Radio, Coimbatore and Trichy for the benefit of farmers. Information relating to the news passed on to the All India Radio is furnished in Appendix-VIII.

(g) **Forecast of pests and diseases through All India Radio:** For the benefit of the farmers, forecasts of pests and diseases were broadcast twice a week, through All India Radio, Coimbatore and Trichy. Appropriate prophylactic and control measures were also suggested to the farmers.

(h) **Farm school on the All India Radio:** A total number of 13 lessons with a duration of 12 to 15 minutes each on Intensive vegetable cultivation, Cotton cultivation, Rainfed Millets cultivation and Modern Dairy Farming were broadcast in the Agricultural Programme on all Wednesdays in Coimbatore All India Radio and they were repeated on all Sundays by All India Radio, Trichy.

(i) **Tamil Nadu Agricultural University Monthly Newsletter:** The monthly newsletter was regularly published and copies sent to the Chancellor, Cabinet Ministers, Government Secretaries, Members of the Board of Management and other important persons and Agricultural Universities and Institutions closely connected with the University.

(j) **Quarterly journal from the Tamil Nadu Agricultural University:** Tamil Nadu Agricultural University published four issues of the Tamil Quarterly Journal *"Valarum Velanmai"* for the benefit of farming community. The journal carries original scientific articles on Agriculture, Animal Husbandry, Forestry, Fisheries and other allied subjects.

(k) **Central Exhibition:** The Central Exhibition at the main campus was visited by 11,124 persons including several scientists, progressive farmers and V. I. Ps. from this State and outside. Students and staff from different institutions of this State and outside also visited the exhibition. The list of important visitors is given in Appendix-I.

(l) **Museum:** The Musem at the main campus of the University was visited by students from schools and colleges from Tamil Nadu and the neighbouring States. The Museum serves as a means of educating the public and school children in biology and agriculture.

(m) **Artists and Photographic Section:** The artists at the main campus prepared large number of posters and charts, pen and ink drawing etc. A large

number of photographs, enlargements, educational slides and other audio-visual aids were prepared.

(n) **University Press:** All the printing works of the Departments and Research stations are being done in the University Offset Printing Press. The important items of work carried out in the Press are given in the Appendix-III.

(o) **Correspondence Course:** The Tamil Nadu Agricultural University imparted correspondence courses in the subjects of Intensive paddy cultivation, Modern Poultry Farming, Tractor Maintenance, Seed Production, Intensive Vegitable cultivation, Cotton cultivation, Banana cultivation, Farm budgetting, Soil and water management and Modern Dairy Farming. Totally 375 farmers were enlisted for these courses during the year.

6. FINANCE AND ACCOUNTS

The following statement indicates the classified summary of the transactions of the University during the year 1975-76.

			Rs. in Lakhs.
1.	**Opening Balance**		6.28
2.	**Receipts**		
	Grant from the State Govt.	...	179.46
	Grant from the I.C.A.R. (including development grant)	...	81.98
	Grant from the Government of India	...	2.97
	Grant from the outside Agencies	...	2.80
	Other receipts: Examination fees, Farm Receipts etc	...	39.99
	General Provident Fund Suspense	...	2.02
	Deposits	...	5.09
	Realisation of short term deposit	...	84.50
	Loans and Advances	...	3.39
	Total	...	408.48
3	**Expenditure**		
	a) University Offices	...	21.27
	b) Estate Office	...	23.90
	c) Capital works	...	{ 10.91 0.80
	d) Agricultural College & Res. Institute, Coimbatore	...	85.50
	e) College of Agricultural Engineering, Coimbatore	...	10.28
	f) Basic Science and Humanities, Coimbatore	...	4.92
	g) Agricultural College and Res. Institute, Madurai	...	35.33
	h) Research Stations	...	23.01
	i) I.C.A.R. Schemes (including Dev. Grant)	...	60.39
	j) Outside Agencies	...	0.33
	k) Central Government Schemes	...	2.79
	l) G.P.F. Suspense	...	1.76
	m) Short term Deposit	...	91.80
	n) Deposit Refunds	...	4.90
	o) Loans and Advances	...	5.59
		...	383.48
	Closing Balance Rs. 408.48 lakhs - 383.48 lakhs.		25.00

The Finance Committee has met twice during the year 1975-76 mainly to consider the proposals for the Revised Estimate '75-'76 and the Budget Estimate 1976-77 to be sent to the Government for making necessary provision in the State Budget as grant to the Tamil Nadu Agricultural University and for finalisation of the Budget Estimate for '76-'77 within the ceiling of the tentative allotment of grant made by the State Government to this University.

Outside Contributions During 1975-76. The two companies M/s. Seshasayee Paper and Boards Limited, Erode and M/S South India Viscose limited, Sirumugai offered to finance a ten year project for research with a total out lay of Rs. 11,21,600 on tree improvement with reference to the needs of pulping industries in Tamil Nadu. Accordingly, for the year 1975-76 a sum of Rs. 1,90,370/- and Rs. 25,000/- were received from M/s Seshasayee Paper and Boards Ltd., Erode and M/s South India Viscose Ltd., Sirumugai respectively.

Acquisition/lease of Lands: (a) An extent of 200 hectares of forest land in Odanthurai, Reserve Forest. near Mettupalayam has been allotted by the State Government for ten years on a nominal lease amount of Re. 1/- per hectare per annum to take up the research and study into forestry problems.

(b) An area of 114.05 acres has been purchased for a sum of Rs.9.00 lakhs for Horticultural Research Station, Yercaud.

Scholarship and Prizes: The expenditure by the Agricultural College and Research Institute, Coimbatore and Madurai on scholarship in 1975-'76 was Rs. 75,245/-. These scholarships have been instituted when these colleges were under the control of State Government. Besides, a sum of Rs. 10,000/- during the year was received from Indian Overseas Bank, Madras towards award of scholarship for a M. Sc. (Ag.) Student in Agricultural Economics.

The following endowments were created for institution of Medals during 1975-76.

1) An endowment of Rs 5,000/- was instituted by M/s Aspee Agricultural Research and Development Foundation, Bombay, the interest from which is to be utilised for award of a medal to the best B.Sc. (Ag.) Student who has obtained the highest marks in the subject "Plant protection in the B. Sc. (Ag.) degree programme"

2) An endowment of Rs. 1,000/- was instituted by Dr. C. H. Venkateswaran, Coimbatore to be called 'Srimathi Ganga Bai Venkateswaran Medal' the interest from which is to be utilised for the award of a medal to the best M. Sc. (Ag.) Student in Agricultural Entomology passing out of the University.

3) An endowment of Rs. 1,000/- was instituted by Mrs and Mr J. Sakharam Rao Coimbatore to be called "Shri P. S. Jivanna Rao Medal" in memory of Late Shri P. S. Jivanna Rao, Systematic Botanist of Agricultural College, Coimbatore, the interest from which is to be utilised for

the award of a medal to the best M. Sc. (Ag.) Student in Plant Pathology passing out of the University.

4) An endowment of Rs. 9,000/- was instituted by Dr. G. Venkatachalam, Director of Animal Husbandry (Retired), Madras, for the award of these medals (i) Dr. (Mrs) V. Jayalakshmi Venkatachalam of Tuticorin, in memory of Late Dr. (Mrs) V. Jayalakshmi Venkatachalam of Tuticorin for the best sports Woman of the University (ii) Dr. G. Venkatachalam Medal for Agriculture for the best B. Sc. (Ag.) student in Animal Husbandry of the B. Sc (Ag.) degree programme.

iii) Dr. Venkatachalam Medal for Veterinary and Animal Sciences for the best B. V. Sc., Student in Animal Nutrition.

Grants in aid: Grant or subscription were paid to the following Institutions during 1975-76.

i)	Staff Club	Rs.	5,000/-
ii)	Ladies Club	Rs.	600/-
iii)	Madras Agrl. Students Union	Rs.	4,000/-
iv)	Indian Agrl. University Association, New Delhi	Rs.	3,000/-
v)	Ulavar Thunaivan, Madurai	Rs.	3,000/-
vi)	Association of Indian Universities, New Delhi	Rs.	4,500/-
vii)	Institute of Techno-Economic Studies, Madras	Rs.	100/-
viii)	Current Science Association, Bangalore	Rs.	500/-
xi)	Association of Common Wealth Universities, London.	Rs.	9,215/-

University Budget for 1976-77: The annual financial estimates of the Tamil Nadu Agricultural University have been approved by the Finance Committee and the Board of Management for a gross appropriation of Rs. 231.64 lakhs (excluding I.C.A.R and G.O I. Schemes.)

A sum of Rs. 191.55 lakhs is expected as grant from the State Government for the University in 1976-'77 for implementing various Education and Research Programmes. Other University receipts will be in the order of Rs. 36.65 lakhs approximately.

Grants from outside bodies: 1) An amount of Rs. 20 lakhs is expected from the Ford Foundation as grant for development of Rural Social Sciences, to this University.

2) I. C. M. F. Cotton Development and Research Association, Bombay has allotted a sum of Rs. 57,700 this year also for implementing research scheme for breeding early maturing drought resistant, medium staple cotton for harsh ecological zones of Tamil Nadu. As such the above scheme is being continued at Regional Research Station, Kaveripattinam.

A sum of Rs. 40 lakhs is also expected from the I. C. A. R as development grant.

Central Assistance: A sum of Rs. 3.38 lakhs is expected from the Government of India in respect of the schemes taken up with their financial assistance.

Audit: The audit certificates for 1973-'74 have been sent to the I.C.A.R and Government of India for almost all the schemes sponsored by them. The audit of accounts of 1974-'75, work is in progress.

APPENDIX I

LIST OF IMPORTANT VISITORS TO THE TAMIL NADU AGRICULTURAL UNIVERSITY, COIMBATORE

Dr. Abhiswan Sen, Professor of Microbiology, Indian Agricultural Research Institute, New Delhi.

Thiru. S.G. Abhyankar, Head of the Department of Plant Pathology, Konkan Agricultural University, Dapoli.

Dr. Malcolm S. Adiseshiah, Vice-Chancellor, University of Madras, Madras.

Hon. Thiru Si. Pa. Aditanar, Pro-chancellor and Minister of Agriculture, Government of Tamil Nadu.

Dr. K.V. Ahamed Bavappa, Director, CPCRI, Kasaragod.

Dr. R. S. Aiyer, Junior Professor, Division of Soil Science and Agricultural Chemistry, Agricultural College, Vellayani, Kerala State.

Thiru M. Alagarswamy, B.A., Planter, Pattiveeranpatti.

Dr. N.K. Ananda Roa, Deputy Director General, (Edncation) ICAR, New Delhi.

Thiru Anantha Roa Patil, Convenor (Estimate committee, Lok Sabha) New Delhi.

Thiru S. E. Anantharaman, Chief Engineer, Tamil Nadu Agro-Industries Corporation, Madras.

Thiru Aravindan, Scientist, ICAR, New Delhi.

Dr. J. S. Arora, Senior Regional Manager, Food Corporation of India, Madras.

Thiru K. S. Arthanareeswara Gounder, Singampettai, Bhavani Taluk, Coimbatore District.

Thiru M. Arunachalam, Joint President, South Arcot District Agricultural Association, Pagandai.

Thiru M. K. Arunachalam, Planter, Ayyampalayam.

Mr. A. Aziz Cedarif, Sudan.

Dr. Balbir Singh Dev, Head of Department of Animal Sciences, Punjab Agricultural University, Ludhiana.

Thiru Y. P. Bali, Deputy Commissioner, Soil Survey, Government of India, New Delhi.

Dr. D. R. Bapat, Sorghum Breeder, Agricultural University, Parbhani.

Thiru Barjinder Singh, Biv-Fertilizers Company Private Limited, Amar-Hill, Saki-Vihar Road, Bombay-400072.

Dr. N. Barua, Adviser to Vice-Chancellor, Assam Agricultural University, Jorhat.

Dr. Berger, F.A.O., Consultant on Nutrition.

Dr. V. P. Bhide, Hajelab, Poona-4.

Dr. Bobalan Dobrazanski, Warsaw, Poland.

Mr. N. S. Brischgis, Chief Agronomist, Potash Industry, GDR, Germany.

Mr. Robert M. Butterfield, Member Rotary Club, Arizona.

Prof. H. R. Cana, Professor and Head, Centre of Advanced Study in Biochemistry, Indian Institute of Science, Bangalore.

Thiru Chaco, Water use expert, Sida Ground water Project, Coimbatore.
Dr. Chadha, Project Co-ordinator, Fruits, ICAR, Lucknow,

Prof. Chathurpujanathiah, Principal, Agricultural Engineering Institute, Raichur.

Thiru Chavan Mathur, Minister for Agriculture, Rajasthan.

Thiru S. V. Chitti Babu, Vice-Chancellor. Madurai University, Madurai.

Mr. M. Chittaranjan, Bio-cultures Manufacturing Laboratories, 79. Lavelle Road, Bangalore.

Thiru K. Chockalingam, IAS, Secretary to Government, Department of Agriculture, Tamil Nadu.

Mr. T. Collister, Education Adviser to the Ministry of Overseas Development, London,

Mr. E. J. Conlon, Consul, Director, US INF Service, Madras-1,

Thiru Damoder Pande, M. P., Lok Sabha, New Delhi.

Dr. Davidson, R. Gwathin, Programme Advisor, Ford Foundation, New Delhi.

Mr. Davys, M.N.G., Rothamsted Experimental Station, England.

Thiru A. B. Deokar, Safflower Breeder.

Thiru U. Dhakshinamoorthy, Director of Youth Welfare, Madurai University. Madurai.

Mr. D. Duflo, Agronomist, Paris,

Dr. J. N. Dube, Microbiology Section, Faculty of Agriculture, Jawaharlal Nehru Krishi Vidyapeeth, Jabalpur.

Mr. T. Evans Brown, Member Rotary club, Arizona.

Prof. W. Feldheim of the Institution of Nutrition, University of Geissen, Federal Republic of Germany.

Mr. Frederic Morizot, Centre culture, France.

Dr. H. Freeman, Joint Co-ordinator, AICRIP, Hydrabad.

Mr. Eric Skogland, Sida Ground Water Project, Coimbatore.

Dr. Ewan Cox Worth, Principal Research Scientist, Chemicals Division, Saskatchewan Research Council, Canada.

Dr. Ganapathy, Kothari Phytochemicals (International), Madurai.

Dr. J. L. Ganarathinam, St. Joseph's College, Tiruchirapalli.

Thiru P. D. Girase, Senior Agronomist (Safflower), Jalgon, Maharashtra.

Thiru V. S. Goenkar, Retired Horticulturist, Agricultural College, Ahmedabad, Bombay.

Thiru S. Gopalan, Director of Agricultural, Kerala State.

Dr. N. Gopalakrishna, Vice-Chancellor, Panjabroa Krishi Vidyapeeth, Akola.

Dr. N. N. Goswami, Senior Soil Scientist, I.A.R.I., New Delhi.

Dr. R.K. Grover, Head of the Division of Plant Pathology, Haryana Agricultural University, Hissar.

Mr. James R. Hammond, Member Rotary Club, Arizona.

Dr. Hegde, Plant Pathologist, ICAR, New Delhi.

Dr. Hiepko, Technical Adviser for Agro Chemicals, Agricultural Experimental Station, Lumbregerhof, West Germany.

Dr. Hyo Guen Park, Associate Plant Breeder, The Asian Research and Development Centre, Shanbna, Taiwan, Republic of China.

Mr. Irvin A. Ingram, Member Rotary Club, Arizona.

Dr. C. M. Jacob, Adviser, Kerala Agricultural University, Mannuthy, Kerala.

Thiru Jagadish Bhatacharya, M.P., Lok Sabha, New Delhi.

Hon. Thiru Jagajivan Ram, Minister for Agriculture and Irrigation, Govt. of India, New Delhi.

Thirumathi Jaya Arunachalam, Secretaty, Farmers' Forum, Madras.

Dr. John Hubbell, The Asian Vegetable Research Centre, Shanhua Taiwan, Republic of China.

Thiru Jogendra Makwand, M. P., Lok Sabha, New Delhi.

Mr. Jon Woodward, Member Rotary Club, Arizona.

Mr. Alan W. Jefery, Salisbury College of Technology, England.

Dr. Joshi, Plant Pathologist, ICAR, New Delhi.

Mr. Josch Mukeebi, Crop Scientist, Department of Crop Science, Mukerere University, Kampala, Uganda.

Mr. Juli, Planter, Rubber Estate, Palavali.

Thiru S. A. Kadar, M. P., Lok Sabha, New Delhi.

Thiru N. Kaleeswaran, I.A.S., Vice-Chancellor, Kerala Agricultural University.

Thiru P. S. Kannan, Southern Roadways, Madurai.

Dr. J. S. Kanwar, Associate Director, ICRISAT, Hydrabad.

Thiru Kota Punniah, M.P., Lok Sabha, New Delhi.

Dr. C. Krishna Rao, Vice-Chancellor, Andhra Pradesh Agricultural University, Hyderabad.

Mr. N. Krishnasamy, Reader, Central Institute of English and Foreign Languages, Hyderabad.

Thiru S.Krishnaswamy, Divisional Superintendent, Southern Railways, Olavakot

Thiru V. Krishnamoorthy, Planter, Kanaikadu.

Dr. J. V. D. K. Kumar Rao, Division of Agricultural Microbiology, University of Agricultural Sciences, Hebbal, Bangalore-24.

Dr. H. Kuipers, UNESCO Consultant, Wageningen, Netherlands.

Thiru S. Lakshmi Subramaniam, Anandavikatan, Madras.

Mr. B. Lerch, Agronomist, Indo-Swiss Project, Mattupatti, Kerala.

Mr. Lobelotteskibsted, Denmark, Holland.

Dr. J.C. Majumdar, Techical Co-ordination Officer, Agrtcultural Production, B.A.S.F. India Ltd., Bombay.

Mr. S. Mahendran, Director, Mascons Ltd,, Colombo, Srilanka.

Dr. Michel Petti, Programme Advaiser, Ford Foundation, New Delhi.

Mr. T. G. Moir, Agronomist, World Bank.

Thiru Mohanlal Sukhadia, Governor of Karnataka.

Dr. N. S. Money, Dean, College of Agriculture, Kerala Agricultural University, Vellayani, Kerala State.

Thiru B. S. Moorthy, M.P., Lok Saba, New Delhi.

Dr. Moris, Plant Pathologist, ICAR, New Delhi.

Professor J. Mukibi, Kampala, Uganda.

Dr. B. R. Murthy, Project Director, Nuclear Research Laboratory, IARI, New Delhi.

Thiru K. Muthumall, President, Tamil Nadu State Agricultural Association Polambakkam P.O., Madurantagam.

Prof. M. S. Nadar, Trichy.

Thiru Nagarajan, Production Engineer, Tamil Nadu Agro Industries Corporation, Madras.

Dr. H.S. Nagaraj Rao, Plant Pathologist, Pulses Improvement Project ARI. Andhra Pradesh Agricultural University, Rajendranagar, Hyderabad.

Thiru W.P.A.R. Nagarajan, Planter, Pattiveeranpatti.

Thiru Natarajan, President, South Indian Teachers Association, Madras.

Thiru R. Natarajan, I. A. S., Special Secretary, Agricultural Department, Government of Tamil Nadu.

Thiru K. Natarajan, Technical Director, Tamil Nadu Co-operative Agro Engineering Federation Ltd., Madras-17.

Dr. J. P. Nauriyal, Director (Hort.), Ministry of Agriculture and Irrigation, Government of India, New Delhi.

Dr. Y. L. Nene, Plant Pathologist, ICRISAT, Hyderabad.

Padmashri S. Natarajan, Director of Projects, SITU Council of Educational Research, Madras.

Thiru. U. S. Natarajan, I. A. S., District Collector, Madurai.

Thiru. Nathuram Mirdha, Chairman, National Commission on Agriculture, New Delhi.

Thiru T. V. Navaneethakrishnan, Agronomist, IADP, Thanjavur Dt.

Dr. Y. S. Nerkar, Professor of Botany, Agricultural University, Parbhani.

Dr. Nicholson, U. N. D. P., Advisor, New Delhi.

Dr. Norman Reynolds, Programme Officer., Ford Foundation, New Delhi.

Mr. D. L. Oswald, ICRISAT, Hyderabad.

Dr. R. B. Patil, Professor of Microbiology, Division of Agricultural Microbiology, University of Agricultural Sciences, Banglore-24.

Mr. P. L. Patil, Agricultural Bacteriologist, College of Agriculture, Poona-5, Maharashtra.

Dr. S. V. Patil, Director of Instructions, Agrl. College and Research Institute, University of Agricultural Sciences, Dharwar.

Dr. Patnaich, Assistant Director General (Finance) ICAR, New Delhi.

Thiru R. Pattabiraman, District Agricultural Officer (Agronomy) Cuddalore.

Thiru Peter, Agro Machinery Corporation, Kerala.

Thiru T. S. S. Perumalsamy, Planter, Adalur.

Mrs. Piere, Nutrition Expert, England.

Thiru S. Prabhakaran, I. A. S., Central Director of Rehabilitation, Government of India, Madras.

Dr. N. N. Prasad, Reader in Microbiology, Faculty of Agriculture, Annamalai University, Annamalainagar.

Thiru J. H. S. Ponnaiah, Additional Director of Agriculture, Department of Agriculture, Government of Tamil Nadu, Madras.

Dr. Ponnamperuma, Soil Chemist, I.R.R.I., Manila, Philippines.

Dr. Radha Shanmugasundaram, University Biochemical Laboratory, University of Madras, Madras.

Dr. V. V. Ragava Roa, Project Director, Ground Water Project, Government of India.

Dr. Rajammal P. Devadas, Assistant Director General (Nutrition), ICAR., New Delhi.

Thiru P. R. M. Rajaram, Planter, Pattiveeranpatti.

Thiru V. P. A. R. Rajaram, Planter, Pattiveeranpatti.

Mr. M. Raju, Diiector of Ground Water, Coimbatore.

Prof. Ramana Reddy, Head, Agricultural Engineering, Andhra Pradesh Agrl. University. Hyderabad.

Dr. T. K. Ramachandra Reddy, Department of Agricultural Microbiology, Dharwar.

Dr. M. N. Ramanujam, Superinteding Engineer, PWD, PAP, Pollachi.

Dr. D. A. Rane, Head of the Department of Horticulture, Agricultural University, Parbhani.

Dr. P. Ranga Reddi, Head of Department of Horticulture, Agricultural College, Rajendranagar.

Thiru D. A. Ramasastry, Director, Regional Meteorological Centre, Madras.

Dr. S. N. Rao, Principal, S. V. Agricultural College, Tirupathi.

Dr. M. V. Rao, Wheat Breeder, New Delhi.

Mr. Robin Cruse, Salisbury, England.

Dr. Rob Williams, Pathologist, ICRISAT, Hyderabad.

Miss Rosalie Lahore, University of Malaysia.

Thiru S. J. Sadiq Pasha, Hon. Minister for Industries and Electricity, Tamil Nadu.

Thiru S. B. Sasharya, Joint Director, Central Planning Commission.

Dr. G. Sathyanarayanan, Mycologist, Tea Research Association Tocklai Experimental Station, Jorhat, Assam.

Dr. R. P. Sarkar, Director, Agricultural Meteorology Division, Poona.

Thiru K. Savadamuthu, Deputy Chief Engineer, Land Development, Office of the Director of Agriculture, Madras.

Major General M. M. Sethna, the Commandant of the Defence Services, Staff College, Wellington.

Hon. Thiru K. K. Shah, Chancellor and Governor of Tamil Nadu.

Dr. R. T. Shand, Consultant Australian National University.

Thiru Shaw Nawaz Khan, Union Minister for State, Agriculture and Irrigation, New Delhi.

Dr. A. Sharma. Associate Breeder, ICRISAT, Hyderabad.

Dr. P. A. Shinde, Professor, Department of Plant Pathology, M. P. K. V., Rahuri, Maharashtra.

Dr. V. P. Shinde, Emeritus Scientist, Poona.

Prof. E. R. B. Shanmugasundaram, University Biochemical laboratory, University of Madras, Madras.

Dr. S. Shanmugasundaram, Research Associate (Breeder), Asian Vegetable Research and Development Centre, Taiwan.

Thiru. D. P. Singh, Chairman, NSC, Government of India, New Delhi.

Thiru Sivaraman, Director, Irrigation Research Station, Poondy.

Dr. R. P. Srivastava, Division of Entomology, IARI, New Delhi.

Hereber H. Stoevener, Department of Agriculture and Resource Economics, Oregan State University, USA.

Thiru K. Sri Ramaraju, Andhra Pradesh Agricultural University, Hyderabad.

Thiru R. V. Subramaniam, Adviser to Governor of Tamil Nadu (in charge of the portfolio of Ministry of Agriculture)

Dr. V. Subramaniam, Director, Paddy Processing Centre, Thiruvarur.

Thiru V. O. C. Subramaniam, USIS, Madras.

Thiru C. Subramaniam, Hon. Minister for Finance, New Delhi.

Dr. B. B. Sundaresan, Dean, College of Engineering, Guindy, Madras.

Dr. K. Subha Rao, Radio Tracer, Agricultural College, APAU, Hyderabad.

Mr. O. Sulieman, FAO/SIDA Courses, Sudan.

Thiru D. C. Salunkhe, Vice-Chancellor, Maruthuwada Agricultural University, Parbhani.

Thiru V. T. Titus, Retd. Director of Public Instruction, Madras.

Mr. Tom. E. Ruchperkins, U. S. A.

Mr. K. Trenggarka, Malaysia.

Mr. R. N. Truelove, Lecturer, Agricultural Economics, Hawkesbury, Agricultural College, Australia.

Thiru M. Umapathy, Chief Engineer (Agrl. Engineering), Madras.

Dr. D. K. Varma, Bio-culture Manufacturing Laboratories, 79, Lavelle Road, Bangalore-1.

Thiru S. Vijayasarathi, Planter, Pattiveeranpatti.

Dr. Vishnu Swarup, Project Co-ordinator, All India Co-ordinated Vegetable Improvement Project, New Delhi.

Thiru L. Venkatarathnam, Agriculture Expert, Hydrabad.

Mr. A. Venkataraman, Director of Agriculture, Department of Agriculture, Government of Tamil Nadu, Madras.

Dr. (Mrs) A. Venkatraman, Kothari Phytochemicals (International), Madurai.

Dr. N. Veeraraghavan, Director, Vector Control Research Centre, Pondicherry.

Thiru M. D. Wahab Mostafa, Oilseeds Breeder, Cairo, Egypt.

Mr. James M. Webb, Member, Rotary Club, Arizona.

Dr. Willard W. Cocharane, Visiting Professor, Minnesota, University U. S. A.

Dr. Y. S. P. Yadav, Project Co-ordinator and Director, Central Soil Research Institute, Karnal.

Thiru Yeswanta Rao Mohite, Minister for Co-operation, Maharashtra.

Prof. S. Ziauddin, Professor of Animal Husbandry, Agricultural University, Parbhani.

Mr. Lenoy H.Zimmerman, USDA, University of Arizona, U. S. A.

APPENDIX II

LIST OF SCHEMES FINANCED BY THE INDIAN COUNCIL OF AGRICULTURAL RESEARCH AND OTHER AGENCIES

Sl. No.	Name of the Scheme	Location	Date of Implementation	Total cost estimates 1975-76 Rs.
1	2	3	4	5
	I. Financed by the ICAR			
	Department of Agronomy			
1.	Integrated Co-ordinated Scheme for studies on Salinity and Water Management	Coimbatore Bhavanisagar Madurai	(V Plan) 1-4-74 to 31-3-79	1,34,600 1,44,200
2.	Co-ordinated Agronomic Experiments Scheme-Staff at Headquarters	Coimbatore	,,	92,900
3.	Co-ordinated Scheme for Model Agronomic Experiments at Selected Centres	Bhavanisagar	,,	52,100
4.	Co-ordinated Dry land Agricultural Research Project	Kovilpatti	,,	2,31,300
5.	Co-ordinated Wheat Improvement Project	Coimbatore	1-10-75 to 31-3-79	17,100
6.	Co-ordinared Research Improvement Project (Sugarcane)	Cuddalore	,,	37,600
7.	Scheme for Research on feasibility of introducing a mixed farming with a view to increase income and employment of small, medium and large scale farmers of backward areas of Tamil Nadu	Kaveripattinam Yercaud	27-2-76 to 31-12-80	100% 8,805 6,405
	II. Department of Agricultural Botany			
8.	Co ordinated Research Project on Oilseeds-Intergrated Centre at Coimbatore (combined) i) Strengthening of Research on Sunflower; ii) Scheme for establishment of Cytogenetical and Physiological studies on groundnut; iii) Strengthening of Research work on groundnut Physiology & Virus units. iv) Main Centre for Sesamum; v) Strengthening of Research work on Safflower and Niger	Coimbatore	1-4-74	4,38,300
9.	Co-ordinated Research project on Oilseeds-Off-season Nursery Project	Pollachi	,,	37,600

1	2	3	4	5
10.	Co-ordinated Research Project on Oil-seeds Sub-Centre for Groundnut	Poliachi	1-4-74	57,400
11.	Co-ordinated Rice Improvement Project	Coimbatore	1-4-74 to 31-3-79	1,21,100
12.	-do-	Madurai	24-10-75 to 31-3-79	17,100
13.	Co-ordinated Project for Research on Forage Crops	Coimbatore	1-4-74 to 31-3-79	93,200
14.	Co-ordinated Millet Improvement Project	,,	,,	92,200
15.	Co-ordinated Sorghum Improvement Project	,,	,,	1,29,900
16.	Co-ordinated Research Project on Cotton Breeding & Agronomy	,,	,,	1,40,700
17.	Co-ordinated Project on Jute and allied fibres-Scheme to evolve superior varieties of Jute, Mesta, Sunnhemp for cultivation in Tamil Nadu	,,	,,	47,600
18.	Co-ordinated Pulses Improvement Project-Scheme for Improvement of Pulses in Tamil Nadu	,,	,,	1,01,300
19.	Scheme for production of Nucleus seeds of recently developed groundnut varieties (of Pol. 1 and Pol. 2	Bhavanisagar	1-11-73 (Three years)	13,000
20.	Co-ordinated Research Project on Oil-seeds-Caster Research	Salem	1-4-74 to 31-3-79	55,200
21.	Co-ordinated Coconut and Arecanut Development Project	Veppankulam	,,	67,000
22.	Co-ordinated Research Project on Cotton Breeding and Agronomy	Srivilliputhur and Kovilpatti	,, ,,	1,58,500 73,900
23.	Co-ordinated Rice Improvement Project	Aduthurai	,,	1,19,000
24.	Co-ordinated Research project on Oil-seeds-Main Centre for Groundnut	Tindivanam	,,	1,31,300
25.	Scheme for production of Nucleus seeds of recently developed groundnut varieties of TMV. 10	Tindivanam	1-6-74 (three years)	11,800

1	2	3	4	5
III.	**Agricultural Entomology**			
26.	Scheme on Nematode Infesting Fruits, Vegetables and other Field Crops	Coimbatore	20-3-67 to 31-3-76	54,400
27.	Scheme on Bionomics and control of the Mango Stemborer (*Bactocera* rufomaculata)	,,	1-10-73 to 30-9-78	24,000
28.	Introduction ot exotic natural enemies for possibie biological control of *Parthenium hysterophrous* and *Solanum elaeagnifolium*	,,	1-10-75 to 30-9-76	11,900
	Horticulture Department			
29.	Co-ordinated Vegetable Improvement Project	,,	1-4-74 to 31-3-79	89,900
30.	Co-ordinated Vegetable Improvement Project	Kovilpatti	,,	43,900
31.	Scheme for the Establishment of Research Station for Improvement of Apples	Kodaikanal	31-3-76	60,900
32.	Scheme for Intensification of Research on Development of Roses and Jasmine varieties with high essential oil contents	Coimbatore	21-6-72 to 20-6-77	70,000
33.	Co-ordinated Project for Improvement Tuber Crops (Other than potato)	,,	1-4-74 to 31-3-79	63,800
34.	Co-ordinated Research Improvement Project (Coconut and Arecanut Improvement in Tamilnadu)	,,	,,	21,000
35.	Co-ordinated Spices and Cashewnut Improvement Project	Vridhachalam	,,	69,000
36.	-do- (Minor Spices)	Coimbatore	,,	51,300
37.	Co-ordinated Research Project for Medicinal and Aromatic plants	Kodaikanal	,,	55,700
38.	Scheme for Research on Temperate Vegetables	Coimbatore	1-7-75 to (Ist 30-6-77 year)	32,700
39.	Scheme for Research on Temperate Vegetables	Kodaikanal	,,	33,800

1	2	3	4	5
40.	Co-ordinated Fruit Improvement Project	Coimbatore	1-4-74 to 31-3-79	2,07,300
41.	Fruit Improvement Project Citrus Fruits	Periakulam	7-8-75	1,35,440
	Engineering Department			
42.	Co-ordinated Scheme for Research and Development of production of prototypes and their evaluation under different agro-climatic conditions (Zonal Research & Prototype)	Coimbatore	1-4-74 to 31-3-79	4,36,700
43.	Scheme for Energy requirements for Agricultural Production Programme	,,	,,	83,100
44.	Scheme for studies on Harvest and Post-harvest Technology	,,	,,	1,34,800
45.	Project of Technical Co-operation between the IDRC Canada & the ICAR, New Delhi on POST HARVEST TECHNOLOGY	,,	1-9-75 to 31-8-79	2,74,272
	Department of Agricultural Economics			
46.	Central Sector Scheme for drought prone areas programme agro-economic Research and Pasture Research under the World Bank Programme for DPAP areas	Kovilpatti	24-10-75	1,33,710
	Extension Education Department			
47.	National Demonstration on Major Food Crops	Madurai	1-4-74 to 31-3-79	82900
	Seed Technolagy Department			
48.	Scheme for Research on Seed Technology	Coimbatore	1-6-73 to 3-17-78	63,600
	Soil Science Department			
49.	Co-ordinated Scheme for Improvement of Soil Physical Conditions to increase Agricultural Production of Problematic Areas (Soil Structure)	,,	1-4-74 to 31-3-79	81,800

1	2	3	4	5
50.	Co-ordinated Programme on Assessment of the effects of fertilizer use and pest management on changing environments under Intensive cropping (Long Term Fertiliser)	Coimbatore	1-4-74 to 31-3-79	19,100
51.	Co-ordinated Scheme on Micronutrients of soils	,,	,,	1,02;800
52.	Co-ordinated Scheme for Investigation on correlation of Soil Test with Crop Responses	,,	,,	96,900

Plant Pathology

53.	Co-ordinated Research Improvement Project (Coconut Wilt Diseases)	Muthupet	,,	43,700

Biology Department

54.	Adhoc Scheme entitled "Studies on interaction between the Rhizobia & Pesticides applied to Seed & Soil	Coimbatore	15-4-75 to 14-4-78	40,000

Fisheries Department

55.	Co-ordinated Research Project on Composite culture of Indian and Exotic Fishes & Fish Seed Production	,,	1-10-75 to 30-9-79	78,120

I. C. A. R. Scheme outside the Tamil Nadu State

56.	Agricultural Polytechnic	Pondicherry	25-3-74	4,00,000

Government of India Schemes

Economics Department

1.	Comprehensive Scheme on cost of Cultivation of Principal crops	Coimbatore	19-10-70	2,95,000

Agricultural Extension Department

2.	Farmer's Training Centre	,,	1-4-74 to 3-13-79	1,19,000
3.	Farmer's Training Centre	Madurai	,,	1,19,000

1	2	3	4	5

University Grants Commission Schemes

1.	Advanced Research in Humanities and Social Sciences - A comprehensive study of the Linguistic Treatment of Message in Oral and Written Communication in Tamil by Scientists - (Department of Languages)	Coimbatore	1-4-75 (one year)	10,000
2.	Pattern of Consumption, Savings and Investment in Agriculture (Agricultural Economics Department)	Coimbatore (2 year Scheme)	1-7-75 to 30-6-76	27,200

Schemes Implemented with Financial Support from Private Agencies

1.	Sunflower Research Scheme (M/S. Hindustan Level Ltd., Bombay)	Coimbatore	3 years 1-10-74 to 30-9-77	29,100
2.	The Scheme for Breeding early maturing drought resistant medium staple cotton for harsh ecological Zones of Tamil Nadu (M/S The ICMF: Cotton Development and Research Association, Bombay)	Kaveripattinam Centre	17-12-74	51,230

Assistance from the following International Agencies for research in the University

1. German Democratic Republic — Protocol arrangement for carrying on research on N-K relationship with certain crops under irrigation in three locations in the State

2. U. S. S. R. — Programme of scientific exchanges and scientific co-operation between Indian National Science Academic and the USSR Academy of Sciences in respect of Nitrogen fixation in soil by (a) symbiotic and (b) Non-symbiotic processes from three participating institutions from Indian side including Tamil Nadu Agricultural University, Coimbatore as one and Institute of Microbiology, Moscow from Soviet side

3. International Foundation for science, Stockhom, Sweden — The foundation has approved the following three projects of the University to be carried out over a period of three years :

   1. Investigation on the relationship between Rhizobia and forage Legumes = $ 6,800
   2. Studies on microbiology of Iddli and dosai fermentation and development of new improved products = $ 5,000
   3. Micorrhizal association in tropical pines in Nilgiris = $ 6,000

APPENDIX III

BOOKS AND BOOKLETS PUBLISHED DURING 1975-76

Books

a. English

1. Chemistry of Fertilizers and manures by A. Maria-kulandai and T. S. Manickam, Published by Asia Publishing House, Bombay.
2. Elements of Economic Entomology by David, B. V. and T. Kumaraswami, Published by M/S Popular Book Depot, Madras. PP. 508.
3. Localisation in Agriculture in Tamil Nadu by Dr. V. Raja-gopalan, S. Varadarajan and N. Srinivasan.
4. Dairy Development and Animal Husbandry in Tamil Nadu by Dr. V. Rajagopalan, Indian Council of Social Science Research, New Delhi.
5. English for Technical students, Book 1. A Review of English Grammar and Usage by R. Sudarsanam.
6. Book 2. A course In Reading and Listening by R. Sudarsanam.
7. Book 3. A course in Productive English by R. Sudarsanam.

b. Tamil

1. Bacterial Plant Pathology by Dr. G. Rangaswami and K. Sivaprakasam. TNAU Publn. pp. 124.

Booklets

Tamil

1. Malai Vazhai by N. Rangaswami and P. V. Rajappan, Fruit Research Station, Periyakulam, TNAU Communication Centre Publn., No. 27.
2. Veettukaikari Thottam by C. R. Muthukrishnan, S. Thamburaj and Seemanthini Ramadoss, TNAU Communication Centre Publn., No. 28.
3. Siruthaniya Payirkalaithakkum Noygalum Thaduppu Muraigalum by Kousalya Gangadharan, C. Parambara-mani and P. Vidyasekaran. TNAU Communication Centre Publn., No. 29.
4. Siruthaniya Payirkalaithakkum Poochigal by T. R. Subramaniam, P. Vasantharaj David, M. S. Venu-gopal and M. Mohanasundaram, TNAU Communication Centre Publn., No. 30.

5. Payirkalin Nachuri Noygal by P. Narayanaswamy, TNAU Communication Centre Publn., No. 31.

6. Kaikarichedigalin Noygal by R. Jeyarajan and Lakshmi Ramakrishnan, TNAU Communication Centre Publn., No. 32.

7. Vazhaiyin Mudikothu Noy by T. K. Kandaswamy, TNAU Communication Centre Publn., No. 33.

8. Sapota by E. Irulappan, K. G. Shanmugavelu and V. N. Madhava Rao, TNAU Communication Centre Publn., No. 34.

9. Cotton by S. Kamalanathan, TNAU Communication Centre.

Journal : 4 issues of quarterly Tamil Journal "Valarum Velanmai" were published. Annual Subscription – Rs. 4.00 - TNAU Publn.

APPENDIX IV

LIST OF SCIENTIFIC PAPERS PUBLISHED

AGRICULTURAL BOTANY

1. Appadurai, R. and R. Nagarajan 1975. Hybrid vigour in pop corn. Madras agric. J. 62: 122–126.
2. Appadurai, R., V.K. Kunjamma Hrishi, K. Meenakshi and S. Suresh. 1973. COH 2. A fodder cum grain sorghum hybrid for Tamil Nadu. Madras agric. J. 60: 1237-1240.
3. Chandramathi, P.S., A. Narayanan, S. Kamalanathan and S.D. Peter. 1974 Role of short branch barbadense selections. Madras agric. J. 61: 979-999.
4. Chandramohan, J., C. Ramalingam and P. Rangaswamy. 1975. A new early variety of onion (Allium cepa L.) for Tamil Nadu. Madras agric. J. 62: 44–47.
5. Kadambavanasundaram, N. and P. Madhava Menon. 1975 Induction of positive miss mutations in cotton by Kien of Gainthi.-Rays. Madras agric. J. 62: 10-17.
6. Krishnaswamy, S. and P. Madhava Menon. 1974. Cytomorphological study on some species and an interspecific hybrid of Barloria L. Cytologia 39: 397-402
7. Kunjamma, V.K., K. Meenakshi, C. Surendran, A.K. Fazlullah Khan and A. Subramaniam. 1975. Hybridization programme in sorghum. Sorghum News Letter 18:60.
8. Kunjamma Hrishi, V.K. and K. Meenakshi. 1975. Preliminary studies on Induction of Mutations in Sorghum. Sorghum News Letter 18:61.
9. Kunjamma Hrishi, V.K., C. Surendran, A.K. Fazlullah Khan and K. Meenakshi. 1975. Mutation Breeding. Sorghum News Letter 18:62.
10. Kunjamma, V.K., K. Meenakshi and C. Surendran. 1973. A new source of cytoplasmic Genic male sterility in Genus sorghum. Madras agric. J. 60: 1811-1813.
11. Marappan, P.V., P.S. Chandramathi and S.S. Narayanan. 1974. Studies on irrigation frequencies in cotton MCU. 5. in relation to growth phases. Madras agric. J. 9: 840-847.
12. Meenakshi, K., A.K. Fazlullah khan, C. Surendran and V.K. Kunjamma Hrishi. 1973. Sorghum Investigations in Coimbatore during 1973. Sorghum News Letter 18:60.

13. Meenakshi, K., V.K. Kunjamma Hrishi, A.K. Fazlullah Khan, C. Surendran and A. Subramanian. 1975. Development of high yielding Sorghum varieties. sorghum News Letter 18:60.

14. Meenakshi, K., A.K. Fazlullah Khan, S. Suresh and C. Surendran. 1975. Studies on the performance of high protein sorghum lines. Sorghum News letter 18:69.

15. Meenakshi, K., V. K. Kunjamma Hrishi, C. Surendran, A.K. Fazlullah Khan and A. Subramanion. 1975. Performance of sorghum hybrids and varieties under different levels of fertility and plant protection. Sorghum News letter 18:70.

16. Mohammed Sheriff, N., S. Thangavelu and C. Surendran. 1974. Influence of time of sowing on the yield of sorghum CSH.1 and Swarna. Madras agric. J. 61:936-939.

17. Mohammed Sherif, N., W. Mohamed Alikhan and R.Veeraswamy. 1975. Studies on the inheritance of certain plant characters in redgram Cajanus cajan L. Mill sp. Madras agric. J. 62: 64-65.

18. Narayanan. S.S., N. Sundaram and S.D. Peter. 1975. A note on oil content in the Asiatic Cottons Gossypium anomalum and their amphiploids. Madras agric J. 62: 33-35.

19. Ramachandran, M. 1974. Selection of garden for Coconut Pilot Demonstration. Coconut Bull. 5 (7&8): 5-8.

20. Ramachandran, M., A.N. Venkateswaran, K. Balasubramanian and V.N. Muralidharan. 1975. Performance of T x D Hybrid palm at Veppankulam. Coconut Bull, 6 (7): 1-4

21. Ramachandran, M., A.N. Venkateswaran, C.S. Sridharan and K. Balasubramanian. 1974. Performance of different coconut hybrids. A preliminary study. Coconut Bull. 5 (4): 1-6.

22. Ramanujam, K., U. Selvaraj, S. Kamalanathan and S.Iyemperumal. 1975. MCU 8. A new extra-long staple cotton for the irrigated Summer. Cotton Development 5 (3) : 10-14

23. Sethupathiramalingam, R. 1976. A note on the induced variation in Chillies. Curr. Sci. 45: 69.

24. Sivaram, M.R. and P. Madhava Menon. 1974. Studies on radio biological effects of X-irradiation in castor. Madras agric. J. 61: 930-935.

25. Subramanian, M. and P. Sivasubramanian. 1975. X-ray induced fused perianth in Ricinus communis L. Radiat. Bot. 15: 307-308.

26. Veeraswamy, R., Rathnasamy, R. and M. Murugesan. 1975. Path Analysis in redgram (Cajanus cajan L. Mill sp.). Madras agric. J. 62: 166–168.

27. Venketeswaran, A. N., M. Ramachandran, R. Rajagopalan and C. S. Sridharan. 1975. A study on coconut plantations in Tamil Nadu Coconut Bull. 5 (10): 3-4.

AGRONOMY

28. Appadurai, R. and K. V. Selvaraj. 1974. A note on groundnut red-gram mixture in Lower Bhavani Project Area. Madras agric. J. 61 : 803-804.

29. Arunachalam, N., Y. B. Morachan and K. Rajagopal. 1974. Effect of nitrification inhibitors on rice under different moisture levels. Madras agric. J. 61 : 677-678.

30. Arunachalam, N. and Y. B. Morachan. 1974. Use of nitrification inhibitors for enhancing crude protein status in rice grain. Madras agric. J. 61 : 695-696.

31. Chamy, A., S. Kamalanathan, Y. B. Morachan and M. Murugesan. 1974. The effect of spacing and manuring on earliness of winter irrigated American cotton. Madras agric. J. 61 : 841-842.

32. Chamy, A., N. Sundaramurthy and S. Kamalanathan. 1974. Studies on the incidence of Boll worms Earias sp. (Lepidoptera) on cottor (G. hirsutum) as influenced by varieties, spacings and manuring Madras agric. J. 61 : 870-871.

33. Chandragiri, K. K., M. S. Ramakrishnan, K. N. Chinnaswamy. O. S Kandaswamy and S. Varisai Muhammad. 1974. Varietal performanc of rice under Bhavanisagar condition. Madras agric. J. 61 : 691-692

34. Chowdappan, S. R. 1974. Studies on the quality aspects of sugar cane after its scheduled maturity. Madras agric. J. 61 : 878-880.

35. Chowdappan, S. R. 1974. Loss in weight vs. quality in sugarcan Madras agric. J. 61 : 881-883.

36. Chowdappan, S. R. and Y. B. Morachan. 1975. Reducing boll sheddir in cotton by treatment with 'Planofix'. Madras agric. J. 62 : 159-16

37. Chowdappan, S. R. and Y. B. Morachan. 1974. Effect of soaki cotton seed in succinic acid in relation to fertilizers use. Madras agr J. 61 : 839-840.

38. Chowdappan, S. R. and Y. B. Morachan. 1974. Study on the methods of fertilizer placement to cotton (Var. MCU. 5). Madras agric J: 61. 843-844.

39. Damodaran, A., S. Kamalanathan, A. Chamy, D. S. Aaron and P. K. Ramakrishnan. 1974. Influence of topping on the characters of American cotton (G. hirsutum). Madrns agric. J. 61: 855-857.

40. Damodaran, A. and S. Sankaran. 1974. A note on evaluation of herbicides in cereal legume mixtures. Madras agric. J. 61:924-926

41. Dasan, A. A.. and S. Kolandaiswamy. 1974. Effect of 2-chloroethyl-Trimethyl Ammonium chloride (CCC) on the growth characters of ragi Co 7 (Eleusine coracana) under graded doses of nitrogen. Madras agric. J. 61:767-769.

42. Dharmalingam, V., D. Krishnadoss, L. Robinson and S. Iyemperumal. 1974. Effect of topping rainfed cotton. Madras agric. J. 61:858-860

43. Gopalaswamy, N., N. S. Loganathan, D. Sivasankaran, S. Shanmugasundaram and Y. B. Morachan. 1974. Impact of canal irrigation on the yield of groundnut in the Parambikulam Aliyar Project Area. Madras agric. J. 61:807-808.

44. Gopalaswamy, N., D. Sivasankaran, N. S. Loganathan, Y. B. Morachan and S. Shanmugasundaram. 1974. A note on the suitability of cotton strains in the Parambikulam Aliyar Project Area. Madras agric J. 61:869.

45. Gopal Rao, T. K., S. C. Daniel, T. R. Srinivasan and G. Devarajan. 1975. Use of deoiled cake as a nitrogenous manure to sugarcane. Cooperative Sugar 6:1-8.

46. Gopalaswamy, N., S. Purushothaman, K. M. Palaniswamy. 1974. Effect of nitrogen and potash on the yield of cotton in the Parambikulam Aliyar Project Ayacut. Indian J. Agr. Res. 8:169-172.

47. Gopalaswamy, N., D. Sivasankaran, N. S. Loganathan, Y. B. Morachan and S. Purushothaman. 1974. A note on the performance of cumbu (Bajra) hybrids in Parambikulam Aliyar Project Areas. Madras agric. J. 61:766.

48. Iruthayaraj, M. R., A. Sheik Dawood and Y. B. Morachan. 1974. Effect of stages of harvest of Mesta (Hibiscus cannabinus) varieties. Madras agric. J. 61:897-898.

49. Iruthayaraj, M. R., A. Sheik Dawood and Y. B. Morachan. 1974. Response of phosphorus and potash on the fibre yield of sunnhemp (Crotalaria juncea L.). Madras agric. J. 61:900-902.

50. Iruthayaraj, M. R., T. R. Srinivasn and Y. B. Morachan. 1974. A rapid steam distillation method for estimation of available nitrogen in soils. Madras agric. J. 61 : 615- 618.

51. Iruthayaraj, M.R., T.R. Srinivasan and Y.B. Morachan. 1974. A rapid method of estimation of leaf area of rice leaves. Madras agric. J. 61: 703-705.

52. Jagannathan, N.T., K.V. Selvaraj, M.S. Ramakrishnan. C.T. Natarajan and S. Varisai Muhammad. 1974, Spacing trial on irrigated bunch groundnut. Madras agric. J. 61 : 811.

53. Jagannathan, N.T., K.V. Selvaraj, M.S. Ramakrishnan, C.T. Natarajan and S. Varisai Muhammad. 1974. Performance of new varieties of grouudnut in Bhavanisagar Tract. Madras agric, J. 61 : 815-816.

54. Kailasam, C., A.V. Rajan, S. Sankaran and Y.B. Morachan. 1974. Evaluation of herbicides on the control of White horsenettle (Solanum elaeagnifolium Cav.). A perennial weed in the cultivated fields of Tamil Nadu. Madras agric. J. 61 : 619-623.

55. Kailasam, C., A.V. Rajan, S. Sankaran and Y.B. Morachan. 1974. Effect of 2,4-D on root cuttings of White horsenettle (Solanum elaeagnifolium Cav.). Madras agric. J. 61 : 922-923.

56. Kaliappa, R., S. Venkatachalam, K.M. Nachappan, K.V. Selvaraj and S. Rajaram. 1974. Studies on water requirements of maize. Madras agric. J. 61 : 750-751.

57. Kaliappa, R., S. Venkatachalam, K.M. Nachappan, K.V. Selvaraj, S. Rajaram and M. Manoharan. 1974. Influence of soil moisture stress on yield of ragi (Eleusine coracana L. and Gaertn.) Madras agric. J. 61 : 773-775.

58. Kaliappa, R., K.V. Selvaraj, S. Venkatachalam and K.M. Nachappan. 1974. Effect of moisture regime on sunflower. Madras agric. J. 61 : 826-827.

59. Kaliappa, R., S. Venkatachalam, K.M. Nachappan, K.V. Selvaraj, M. Manoharan and S. Rajaram. 1974. A study on the water requirement of cotton. Madras agric. J. 61 : 850-851.

60. Kandasamy, P.. P. Sundram, G.S. Thangamuthu. A. Gopalan and Sunanda S. Rao. 1974. Relationship of crude protein content with age of the crop and rainfall in Lucerne (Medicago sativa L.). Madras agric. J. 61 : 580-583.

61. Kasiviswalingam, P., S. Kolandaisamy and P. Seshadri. 1974. Foliar application of zinc and its interaction with added phosphorus on rice. Madras agric. J. 61 : 667-668.

62. Kolandaiswamy, S., T. S. Theetharappan and R. Ramamoorthy. 1974. Effect of top dressing of P and K on rice. Madras agric. J. 61:651-652.

63. Krishnarajan, J., D. Sivasankaran, S.Sankaran and Y.B. Morachan. 1974. Studies on the performance of herbicides in sunflower. Madras agric. J. 61:827-828.

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65. Kulandaivelu, R. and V. S. Shanmugasundaram. 1975. Safflower and its uses. Agric. Agro-Industries J. 8 (2 and 3) : 22–23.

66. Kulandaivelu, R., V. S. Shanmugasundaram, N. T. Jagannathan and Y. B. Morachan. 1974. Effect of nitrogen levels and spacings on irrigated safflower (Canthamus tinctorius L.) Madras agric. J. 61:832-833.

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69. Mohamed Ali, A., J. Chandramohan, and R. Santha. 1974. Effect of bed sizes on Arachis hypogaea L. in Lower Bhavani Ayacut. Madras agric. J. 61 : 809-811.

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73 Mohamed Ali, A.; and S. Sankaran. 1975. Efficiency of herbicide stomp in transplanted rice. Pesticides 9 (10) : 41-43.

74 Murugesan, M., P. Ganamurthy and A. Shanmugasubramanian. 1974. Analysis of variance for data on counts. Madras agric. J. 61 : 623-633.

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80. Nageswara Reddy, M. and R. Kaliappa. 1974. Effect of graded doses of nitrogen and plant population on the yield of Deccan hybride maize, Madras agric. J. 61. : 736-738.

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APPENDIX V

INFORMATION WITH REGARD TO QUERRIES ANSWERED

1. Co 36 Paddy cultivation aspects
2. Method of using urea as basal dressing
3. Method of application of urea as foliar nutrition
4. Control measures for leaf blight of IR 20 Paddy
5. Control of shoot drying in paddy
6. Use of application of zinc sulphate for paddy
7. Incidence of disease attack on Bhavani paddy sown in the month of Adi
8. Use of planting paddy during 25th day and 35th day of its age
9. Control of stem borer in paddy
10. Short duration paddy varieties
11. Application of granular pesticide for paddy
12. Control of pest and disease in IR 20 paddy
13. Plant protection measures for paddy nursery
14. Leaching of fertilizers applied in the basal dressing
15. Control of leaf roller in paddy
16. Co 36 paddy - Fertilizer application
17. Methods of application of urea as top dressing for Kanchi paddy variety
18. Control of earhead bugs in paddy
19. Season and cultivation aspects of Vaigai paddy
20. Control of rats in paddy fields
21. Damage of paddy crop by snake and their control
22. Application of Azatobacter for paddy
23. Cultivation aspects of Bhavani paddy
24. Control of crabs in paddy fields
25. Control of stemrot of paddy
26. Mixing of urea in plant protection chemical
27. Cultivation aspect of Kovilpatti tall Cholam
28. Seed rate and availability of Kovilpatti tall seeds
29. Quantity and application of fertilizer for Kovilpatti tall cholam
30. Intercropping in Kovilpatti tall cholam
31. Reasons for non setting of grain during August in the dry crop
32. Hybrid cholam varieties that are grown in Tamil Nadu
33. CSH 5 Cholam cultivation aspects
34. Fertilizer application for CSH 5 cholam
35. Area under HB Cumbu varieties in Tamil Nadu
36. New Cumbu varieties resistant to Green ear
37. Season and seed requirement for Cumbu
38. Manuring for hybrid cumbu varieties
39. Cultivation aspects of HB 3 cumbu in Black soils
40. Cultivation of cumbu as dry crop and its yield
41. Inter cropping in dry crop of cumbu

42. Nutrient content of maize
43. Seed rate and cultivation aspects of maize
44. Application of Azatobacter to one month old maize crop
45. Reason for maize crop to become white
46. Application of granular pesticides to maize
47. Yield of pioneer 102 maize
48. Fertilizer requirement for Ganga-5 Maize
49. Origin of maize
50. Plant protection for Maize crop
51. Reasons for the Ragi leaves becoming white
52. Disease control in Ragi crop
53. Reason for Co 10 Ragi not growing properly
54. Varieties in onion and cultivation aspects of Bellary onion
55. Co 1 onion season, soil type, seed requirement and other cultivation aspects
56. Number of irrigations needed for Co 1 onion
57. Method of assessing the maturity of onion
58. Cost of cultivation and returns from Bellary onion
59. Top dressing of fertilizers for Bellary onion
60. Uses of onion flowers
61. Reasons for drying off of tip in onion
62. Plant protection measures for onion
63. Cultivation aspects of chillies
64. Using of planofix and Teepol for chillies production and the place of availability of the above chemicals
65. Important varieties of chillies and their names
66. Cultivation aspects of K1 and K2 chillies
67. Cultivation aspects of K2 chillies
68. Number of harvests and the time of first harvest
69. Raising of nursery for chillies and their care
70. Application of nitrogen as foliar spray to chillies
71. Mixing of urea in plant protection chemicals and spraying to Chillies
72. Inter cropping in Chillies
73. Cultivation of chillies in alkaline soils
74. Ratooning of chillies
75. Effect of irrigation during flowering in chillies
76. Application of furadan granules to chillies
77. High yielding variety of coriander
78. Cultivation aspects of coriander
79. Cultivation of coriander in dry and irrigated condition
80. Varieties of turmeric and their cultivation aspects
81. Area under turmeric in Coimbatore District
82. Intercropping in Turmeric
83. Leaf curl control in Turmeric

84. Plant Protection for turmeric crop
85. Seed requirement for chicory cultivation for an acre
86. Cultivation a spects of chicory
87. Yield of chicory/acre and use of produce
88. Marketing facilities for chicory
89. Maximum chicory growing area in Tamil Nadu
90. Price of one kilogram chickory seed and the place of availability
91. Mixed cropping in chicory
92. Garlic cultivation aspects
93. Climate suitable for Garlic cultivation
94. Plant Protection Measures for Garlic
95. Varieties of tobacco
96. Cultivation aspects of tobacco
97. Orabanche control in tobacco
98. Nursery preparation of tobacco
99. Area under tobacco in Tamil Nadu
100. Availability of seedlings from Government Nurseries and their price
101. Marketing facilities available for tobacco
102. Cultivation aspects of Groundnut
103. Control of red-hairy caterpillar in groundnut
104. Groundnut cultivation details
105. Groundnut red-hairy caterpillar control measures
106. Groundnut fertilizer application
107. Groundnut Gypsum application
108. Groundnut diseases and control measures
109. TMV 2, TMV 7, TMV 10, POL 1, POL 2 characteristics and their cultivation
110. Irrigation for Groundnut
111. Seasons for different varieties
112. Saline and alkaline soil reclamation
113. Salt water-irrigation precaution
114. Micro nutrients for crops
115. Urea or Ammonium Sulphate application for Sugarcane
116 Foliar spray of urea
117. Package of practices for high yielding varieties of Sugarcane
118. Varieties of Papaya
119. Co. 1 Papaya-Seed availability, Package of Practices
120. Important varieties of Mango and Package of Practices
121. Availability of Mango seedlings.
122. Pruning of Mango
123. Banana varieties and Package of practices
124. Fertilizer application for Banana
125. Pears and Apples of Coonoor
126. Control of Nematode in grape
127. Co. 1, Co.2 Sapota cultivation aspects and availability of plants

128. Availability of arecanut seedlings
129. Vegetable seeds availability
130. Bhendi cultivation
131. Grape cultivation
132. Beet root disease control mesures
133. Fodder beet root cultivation aspects
134. Control of diseases of cabbage
135. Cauliflower cultivation details
136. Brinjal cultivation details
137. Varieties of brinjal, plant protection aspects
138. Availability of beetroot seeds
139. Co 1, Co 2 tomato characteristics, cultivation aspects
140. Kitchen gardening-Cultivation aspects
141. Control measures for brinjal pests
142. Radish varieties and cultivation aspects
143. Potato for plains-their cultivation
144. Control measures for diseases of potato
145. Control of Golden nematode of Potato cost, subsidy etc
146. Nutrient content of potato
147. Ashgourd, Pumpkin varieties and their cultivation aspects
148. Radish cultivation
149. Tapioca varieties, cultivation details and availability of seed material
150. Lab-lab and Avarai cultivation
151. Snake gourd, Ribbed gourd, bitter gourd varieties and their package of practices
152. Jasmine varieties and packace of practices
153. Sambac (செண்பகம்) fruit setting
154. Rose varieties, Package of practices
155. Export Rose variety
156. Crossandra varieties, their cultivation aspects
157. Jathi Malli layer availability
158. Jasmine concrete extraction method, cost of plant etc
159. Details of dryfarming implements
160. Details of seed drills, their manufacture and operation
161. Details of groundnut grader
162. Details of Groundnut Decorticator
163. Details about groundnut digger
164. Details about Gorru, Guntaka and Dhantulu
165. Details of Hydraulic Dynamometer
166. Details and usage of power tiller
167. Details of Sunflower seed sheller
168. Deatils on use of cage wheels
169. Deatils of paddy thresher
170. Details of cotton delinting machine
171. Details of paddy winnower

172. Details of mechanised farming
173. Waste products from Agriculture and their utilisation
174. Tapioca Rava preparation
175. Packaging of tapioca chips
176. Fruit Bars
177. Mushroom recipes
178. Mushroom Industries
179. Food products from minor millets
180, Appalam manufacture
181. Control of Red palm weevil
182. Supply of T x D Coconut seedlings
183. Button shedding in Coconut
184. Calapagonium–green manure for coconut
185. Supply of Coconut varieties
186. Pests and Diseases
187. Information on Research carried out in Sociology and Psychology
188. Census details of Social Science Research
189. Details of cultivation of the improved strains of Castor SA. 1, SA. 2
190. Availability of seed materials of castor strains SA. 1, SA. 2, TMV. 2 and perennial castor Co. 1
191. Improved methods of cultivation of Sunflower and availability of seeds
192. Availability of gliricidia seeds and cuttings
193. Control measures for the castor semilloper, Achaea janata L.
194. Control of Rhinocerous beetle of coconut
195. Control of bud rot disease of coconut
196. Control of wilt disease of coconut
197. Control of leaf blight of coconut
198. Manuring of fruit crops
199. Pruning of guave
200. Methods of planting fruit plants
201. Fishes suited for culture in wells and ponds
202. Fisheries research centres in Tamil Nadu
203. Fish in human nutrition
204. Induced fish breeding
205. Fish marketing and export
206. Reservoirs and their fisheries in Tamil Nadu
207. Information regarding Singapore Kapok
208. Availability of Eucalyptus seedlings
209. Information regarding drought resistant species
210. Growth behaviour of Acacia arabica and Acacia planiforns
211. Details about Vinca rosea
212. Availalility of tree species
213. Regarding Pyrethrum oil
214. Information on chrysarobin
215. Fertility status of soils

216. Fertilizer doses and combinations for rice
217. Reclamation of alkali and saline soils
218. Reclamation of virgin land
219. Package of practices for Sankarapalli Bhendi
220. Installation of gobar gas plant
221. Cultivation of vegetable crops
222. Control of sigatoka leaf spot disease in Banana
223. Information on manuring of Cardamom
224. Package of pracices for cole cultivation
225. Application of growth retardants for banana
226. Availablity of mango grafts
227. Nematode control in crossandra
228. Availability of Co 2 pumpkin seeds
229. Availabilty of seedless guava layers
230. Availability of Red Bhendi seeds
231. Availability of rose cuttings
232. Control of moringa fruit maggot
233. Control of grape vine stem girdler
234. Plant Protection measures against aphids in Chillies
235. Control of tea mosquito bug in neem
236. Mixed cropping in cotton
237. Spacing for rainfed cotton
238. Economics of plant protection for rainfed cotton.
239. Cultivation details for Kovilpatti Tall Sorghum
240. Plant protection for rainfed Cambodia cotton
241. Cultivation details of Bharathi (MCU. 6) cotton
242. Boll shedding In cotton
243. Red leaf incidence in cotton
244. Availability of green gram, black gram and groundnut seeds
245. Availability of CSH 2 cholam seeds
246. Fruit rot of Chillies
247. Powdery mildew and Die-back of chillies
248. Virus infection of chillies
249. Germiniation of TMV 10
250. Package of practices for TMV 10 and TMV 9 groundnut
251. Supply of TMV. 9
252. Incidence of surul poochi and tikka leaf spot
253. Effect of sea water mixing with KCl and K_2 SO_4 during fertilizer transport in ship
254. Tolerance of crops to Na Cl
255. Radio isotopes in Agriculture
256. Dipping of rice seedlings in super phosphate solution
257. Application of borax
258. Application of lime
259. Improving soil fertility

260. Micronutrient deficiency systems in plants and application of micronutrients like Zn, Cu, Fe, Mo etc.
261. Secondary nutrients like Ca, Mg and S
262. Extraction of organic acids from Cotton leaf
263. Use of organic manures
264. Use of complex fertilizers
265. Time of application of superphosphate to rice
266. Soil Management
267. Green manure decomposition
268. Credit facilities extended by Government, Cooperatives and Commericial Banks for purchase of inputs
269. Regulated Markets, their role, No. in the States, facilities offered to the farmers
270. Area under Sugarcane, Pulses, Cotton Groundnut and Banana and the important places where they are grown in Tamil Nadu and India
271. Crop Insurance
272. Cost of cultivation of crops
273. Water divining.
274. Names of varieties suitable for cultivation in different areas of Tamil Nadu.
275. Traits of saline resistant variets like SR 26B, PVR, 1, Getu, Dasal etc.
276. Varieties suitable for late planting condition
277. Varieties with resistance to pest and diseases
278. Particulars of special varieties scented, non-scented, Biriyani rice, Basumathi, Pusa 33 etc
279. Particulars about GEB 24
280. Particulars about quality rice varieties with good cooking quality
281. Varieties suitable for continuous cropping
282. Seed rate for different varieties
283. Seed rate for direct seeding under puddled condition and Broadcast
284. Varieties suitable for different crop rotations
285. Time of sowing for summer cotton.
286. Whether bagging is necessary or not In CBS. 156 hybridisation
287. How many of flowers can be dusted with one male flower
288. Whether the left over female flowers can be dusted in the next day or not
289. Cultivation details of forage crops
290. Availabilities of hybrid napier grass slips
291. Availabilities of lucerne seeds
292. Informatian on pastures, rainfed grasses and soil conservation grasses
293. Information on other economic plants like fibres, oilseed, medicinal plants, gums etc
294. Identification of plant specimens for public and other departmental officers
295. Availability of lab-lab Co 6, Co 7 and Co 8

296. Availability of Bengalgram CO 1
297. Normal spacing for cowpea CO 2 and manurial schedule
298. Suitable pulse crop for Winter sowing at Sulur block under limited irrigated conditions
299. Suitable greengram strain to grow along with cotton
300. Growing Bengalgram with sugarcane as intercrop
301. Control measure for Wilt disease in Bengalgram grown with sugarcane
302. Super phosphate necessity for lab-lab CO 6, CO 7 and CO 8
303. Availability of Pandal Avarai CO 3 and CO 5
304. Bacterial culture treatment for Pulse crops
305. Cultivation of geranium
306. Cultural practices for pyrethrum
307. Cultivation practices and potentialities of Vinca Rosea
308. Cultural practices for citronella
309. Manurial schedule for apple
310. Culture of apple and plum
311. Information on use of growth regulators on pineapple.
312. Availability of linaloe
313. Cultivation of strawberry
314. Availability of peas and beans
315. Cultivation of mint
316. Ecto parasites of Livestock and their prevention
317. Foot and Mouth disease, the symptoms and prevention
318. Availability of crossbred cows and buffaloes
319. Guidance regarding staring of Poultry Farm.
320 Guidance regarding staring of Dairy
321. Silage and its preparation
322. Luxation of patella and its treatment
323. Poultry diseases and their prevention
324. Information regarding starting of sheep farm
325. Information regarding srarting of piggery
326. Nutritive value of milk, egg and meat.
327. Cultivation of grass and leguminous fodder
328. Guidance regarding starting of Turkey farm
329. Availability of chicks and hatching eggs
330. Information regarding Orphan Calf rearing
331. Loan facilities for dairy farming
332. Training in dairy farming
333. Foot and mouth disease, its treatments
334. Availability of publications on dairy farming
335. Preservation of fodder
336. Loan facilities for poultry farming
337. Economic feeding of dairy animals
338. Availability of good milch gaats
339. Maintenance of goats

340. Availability of crossbred bull calves and bullocks
341. Technique of extraction of seed of brinjal
342. Technique of extraction of seeds of tomato
343. Delinting of cotton seeds by acid treatments
344. Use of Ethrel and pruning in mango to increase yield
345. Package of practices for Co 2 papaya
346. Production of papain
347. Availability of Robusta. Dwarf Cavendish and Gro-Michel banana suckers
348. Raisin making of seedless grapes in Cumbum Valley
349. Use of growth regulators, pruning methods etc. for improvement in grapes
350. Availability of acid lime seedlings
351. Propagation and pruning methods in guava
352. Availability of Co 1 and Co 2 sapota grafts
353. Availability of arecanut seedlings
354. Causes for poor fruit' set in coconut
355. Non-bearing of Anab-e-Shahi
356. Foliar application of urea on guava
357. Availability of Linaloe plants
358. Availability of mango grafts
359. Package of practices for Robusta and Dwarf Cavendish banana
360. Double planting of Dwarf Cavendish
361. Papain extraction in Co. 2 papaya
362. Ripening of banana by using Ethrel
363. Cultivation details of fruit crops
364. Control of weeds in banana
365. Information on supply of Jack and Bread fruit
366. Overproduction of staminate flowers in pumpkin and use of ethrel to overcome the problem
367. Availability of Co 1, Sweet potato and Co 1 tapioaa cuttings
368. Supply of Co 1 bhendi seeds
369. Information on Co 1 and 2 pumpkin
370. Supply of Co 1 Amaranthus and Co 1 Ashgourd seeds
371. Package of practices for Co 1 Snakegourd and Co 1 Ribbed gourd
372. Cultivation hints on watermelon. musk melon and cucumbers
373. Availability of water melon seeds
374. Cultivation details on white radish
375. Fruit cracking cause in tomato
376. Availability of Co 1 and Co 2 tomato seeds
377. Information on chow-chow mosaic disease
378. Information on tomato paste production and suitable varieties
379. Storage of sweet potato and tapioca tubers
380. Information on short pudals for summer
381. Dehydration on tapioca
382. Economise the use of planting material and storage of tapioca cuttings
383. Cultivation details of curcurbitaceous vegetables

384. Information on cabbage and other cole crops suitable for the plains
385. Cultivation details in avarai, beans and peas
386. Information on medicianal and aromatic plants
387. Cultivation details on Japanese Pappermint
388. Availability of Pari Mullai plants
389. Ornamental garden layout
390. Availability of chrysanthemum suckers and crossandra seeds
391. Availability of flower seeds
392. Package practices for economic flower
393. Supply of superior crotons
394. Cultivation details of pine apple
395. Details of cacao cultivation
396. Propagation of cuttings in mist chamber
397. Supply of superior cashew planting materials
398. Use growth regulators in cashew propagation
399. Use of weedicides In vegetable cultivation
400. Cultivation of Turmeric and Ginger
401. Information on cultivation of condiments and aromatic herbs
402. Details on Lemon cultivation
403. Seeds extraction in Tomato
404. Dormancy in gourd seeds
405. Layout of kitchen gardens
406. Landscape gardens-layout
407. Information on Gundu types of chilles
408. Information on short duration vegetables crops
409. Information on companion cropping in vegetables
410. Causes and control measures in bunchy top in banana
411. Nutritive value of greens like Amaranthus, Palak etc.
412. Ratooning of banana and Pine apple
413. Plant protection methods in vegetables

APPENDIX-VI

NUMBER OF ENQUIRIES ANSWERED AND QUANTITY OF IMPROVED SEEDS, PLANTS ETC. SUPPLIED BY THE VARIOUS DEPARTMENTS OF THE TAMIL NADU AGRICULTURAL UNIVERSITY.

Crop, Problems etc.,	No. of enquiries for which technical advice was provided.	Quantity of seeds of improved strains supplied for experimental purposes (kg)	Quantity of seeds for improved strains supplied for multiplication.	Quantity of seeds of improved strains supplied for general cultivation (kg)	Plants and Misc. materials supplied (Nos).
1	2	3	4	5	6
Rice	1655	13,572	7515	2,20,035	—
Cotton	1318	47	—	810	—
Millets	615	147	40	2085	—
Minor Millets	231	30	40	195	—
Oil seeds	143	130	3683	11530	37013
Pulses	440	430	599	3936	—
Fruits	1403	7	2	—	13582
Vegetables	1589	184	25	476	48625
Flowers	337	—	—	—	7814
Green manure seeds	—	—	—	—	125
Mushroom(Spawn) bottles distributed.		—	—	—	—
Agri. Tree killer	—	—	—	—	—
Cultivator's problem	87	—	—	—	—
Crop disease problems and supply of specimens.	285	—	—	—	—
Fertilizers enquiries	137	—	—	—	—
Bacterial culture	—	—	—	—	61000
Booklets sold	—	—	—	—	3579
Forage	84	—	—	—	500
Seed Testing	21	—	—	—	—
Squash bottles	—	—	—	—	729
Pests of plants	660	—	—	—	—
Implements, soil and water conservation engineering	64	—	—	—	—
Animal Husdandry-eggs, birds etc.,	191		—	—	1,22,142
Milk	—	—	—	79,130	—
Forest culture	9	—	—	—	—
Fish culture	36	—	—	—	—
Food preparations	72	—	—	—	—

APPENDIX VII

LIST OF POPULAR ARTICLES AND JOTTINGS PUBLISHED

Sl. No.	Title of the article	Newspaper/journals in which published
1.	Co.38 Paddy	Tamil Arasu, - April 1975 Uzhavar Nalam - May 1975
2.	Co.39 Paddy	Tamil Arasu - April 1975 Uzhavar Nalam - May 1975 Uramum Payirum - September 1975
3.	K.2. Chillies	Tamil Arasu - April 1975 Er Uzhavan - May 1975 Uzhavar Thunaivan - May-June 1975
4.	Co.2 Onion	Tamil Arasu - April 1975 Nava India - May 1975 Dinamalar - May 1975 Malai Murasu - 21-1-75 Uramum Payirum - September 75, (vol. 12-2)
5.	Gingelly and Sulphur	Pannai Thozhil - April 1975 Nilavalam - April 1975 Uzhavar Thunaivan - Aug-Sep 1975
6.	Powdery mildew of Bhendi and its control	Pannai Thozhil - April 1975 Malai Murasu - 1-4-75
7.	Cotton root diseases and their control	Er Uzhavan - May 1975 Malai Murasu - 27-5-75
8.	Tapioca diseases and their contrel	Nava India - 1.4.75 Malai Murasu - 1-4-75
9.	Ratooning of Banana	Nava India - 1-4-75 Malai Murasu - 8-4-75 Er Uzhavan - June 1975 Uzhavar Thunaivan - May-June 1975
10.	Double planting of Banana	Malai Murasu - 8-4-75 Uzhavar Thunaivan - May-June 1975 Er Uzhavan - October 1975 Nava India 1-4-75 Pannai Thozhil - Oct-November 75

11.	Irrigation for rice	Malai Murasu 15-4-75 Nilavalam - April 1975
12.	Possible causes of decline of Anab-E-Shahi around Coimbatore	Malai Murasu 22-4-75
13.	Chillies root nematode	Nava India 29-4-75 Farm & Factory - May 75
14.	Vivasaya Nagareegam	Nava India 29-4-75 Pannai Thozhil - June 1975 Uzhavar Thunaivan - November 1975
15.	Jack fruit squash	Nilavalam - April 1975
16.	Mango seed products	Er Uzhavan - May 75
17.	TNAU Communication Centre	Nava india 6-5-75 Malai Murasu 10-6-75 Uzhavar Thunaivan - May-June 75
18.	More yield in papaya	Malai Murasu 13-5-75
19.	Poultry disease control	Nava India 13-5-76
20.	Farmers Discussion Group in Extension work	Nava India 20-5-75 Uzhavar Thunaivan - October 75
21.	Role of High yielding table varie ties of poultry birds in small for- mers economy	Tamil Arasu-June 1975
22.	New pest control of Brinjal pests	Tamil Arasu - June 1975 Velalar Nalvalvu - June 1975 Uzhavar Thunaivan - June 75
23.	New pest control for Bhendi pests	Tamil Arasu - June 75 Velalar Nalvalvu - June 75 Uzhavar Thunaivah - July 75
24.	Earn while your learn	Farm & Machinery - June 75 Nava India 1-7-75 Pannai Thozhil - July 75 Tamil Arasu - September 75
25.	Coconut varieties for Tamil Nadu	Farm & Factory - June 75 Tamil Arasu 16-9-75
26.	Control for shedding of buttons in coconut	Farm & Factory - June 75
27.	Fungicidal control of foliar dise- ases of cholam	Farm & Factory - June 75

28.	Youth is an asset for Extension work	Velalar Nalvalvu - June 75 Uzhavar Thunaivan - Aug-Sept. 75
29.	How to cultivate ragi crop in Parambikulam Aliyar Project	Malai Murasu 17-6-75
30.	Farmers willing farm broadcast methods	Nava India 24-6-75 Uzhavar Thunaivan - Aug-Sept. 75
31.	Mosaic disease in Tapioca	Tamil Arasu - July 75 Malai Murasu 1-7-75
32.	Tamil Nadu Agricultural Uniyersity helping green revolution.	Tamil Arasu - July 75
33.	Marex disease in poulty	Sakthi Sugars Seithi Madal-June-July 75 Uzhavar Thunaivan-May-June 75
34.	Potash for ragi, to improve yield of Co. 7 Ragi	Nava India - July 75 Malai Murasn - July 75 Pannai Thozhil - July 75 Er Uzhavan - August 75 Tamil Arasu - September 75 Uzhavar Thunaivan - August-Sept. 75
35.	Water requirement for paddy and how to irrigate paddy	Nava India 1-7-75 Malai Murasu 15-7-75 Pannai Thozhil - July 75 Er Uzhavan - July 75 Tamil Arasu - August 75 Mahajanam - August 75 Uzahavar Thunaivan - Aug-Sept. 75 Nava India - Oclober 75
36.	Bunchy top disease of banana and how to control	Nava India 1-7-75 Malai Murasu 8-7-75 Er Uzhanavan - July 75 Mahajanam - July 75 Tamil Arasu - August 75
37.	Sowing trial in Paddy	Nava India 1-7-75 Malai Murasu 15-7-75 Pannai Thozhil - July 75 Tamil Arasu - August 75 Mahajanam - August 75 Uzhavar Thunavian - August 75
38.	Nitrogen for paddy in 4 Stages	Er Uzhavan - July 75 Nava India 1-7-75 Malai Murasu 15-7-75 Pannai Thozhil - July 75 Mahajanam - July 75 Tamii Arasu - Angust 75 Farm & Factory - August 75 Uzhavar Thunaivan - Aug. - Sept. 75

39.	Sunflower	Nava India 1-7-75 Mahajanam - July 75 Pannai Thozhil - July 75 Farm & Factory - August 75
40.	Requirement of nutrients for tomato	Nava India 7-7-75 Pannai Thozhil - July 75 Malai Murasu - 29-7-75 Tamil Arasu - August 75 Uzhavar Thunaivan - Aug. - Sept. 75
41.	Taking the research findings to the farmers' field - noble task	Nilavalam - May 1975
42.	Increased yield in Rose	Pannai Thozhil - July 75 Er Uzhavan - July 75
43.	Reclamation of saline lands	Pannai Thozhil - July 75 Tamil Arasu - July 75 Mahajanam - July 75 Malai Murasu - July 75
44.	Magnesium sulphate increases Paddy yield	Pannai Thozhil - July 75 Er Uzhavan - July 75 Tamil Arasu - August 75 Mahajanam - August 75 Uzhavar Thunaivan - Aug-Sept 75 Uramum Payrirum - January 76
45.	To increase yield of Kanakambarm	Pannai Thozhil - July 75 Er Uzhavan - July 75 Malai Murasu - July 75
46.	Diseases of Turmeric and how to control	Er Uzhavan - July 75 Malai Murasu - 12-8-75
47.	New findings in manuring mullai plants	Uzhavar Thunaivan - April 75
48.	The IS.3541 Sorghum variety suited for Tamil Nadu, giving increased yield and resistant to powdery mildew	Uzhavar Thunaivan - April 75
49.	Tomato root knot nematode and how to control	—do—
50.	Spraying nitrogen to Samanthi gives increased yields	—do—
51.	Bhendi nematode and its control	—do—
52.	Six times manuring per year gives more yield in Jathi Malli	—do—

53.	Extraction of scented oil from mullai varieties	Uramum Paiyirum - Jan-March 75 Nava India - 5-8-75
54.	Nutrient requirements of papaya	Uzhavar Thunaivan - May-Juue 75
55.	Increased yield in closer spacing in samanthi	—do—
56.	Spreading of bacterial disease in cotton	Uzhavar Thunaivan - May-June 75
57.	Fish culture in wells	—do—
58.	Tasty drink in jack	—do—
59.	Benefits of Agricultural Broadcasts	—do—
60.	Guava Fruit Halva	—do—
61.	Economic conditions of small farmers and agricultural labourers	Pannai Thozhil - August 75 Tamil Arasu - September 75
62.	Changes due to loans given for digging wells by Land Development Banks	Pannai Thozhil - August 75 Tamil Arasu - September 75 Uzhavar Thunaivan - Aug-Sept. 75
63.	Pruning in mango	Tamil Arasu - September 75 Nava India 29-7-75 Malai Murasu 5-8-75 Financial Express 28-7-75 Nilavalam - July-Aug 75 Uzhavar Thunaivan - Aug-Sept. 75 Pannai Thozhil - October 75
64.	Production of chillies and marketing	Er Uzhavan - August 75 Tamil Arasu - Septemper 75 Uzhavar Thunaivan - November 75
65.	How to control paddy stem-borer?	Er Uzhavan - August 75
66,	Nitrogen for sunflower	Tamil Arasu - August 75 Uzhavar Thunaivan - Aug-Sept. 75
67.	To control disease in sugarcane	Nava India - August 75 Malai Murasu - 19-8-75 Er Uzhavan 6-9-75 Kalanjiyam - Oct. 75 (Malar 4 Ithal 4) Pannai Thozhil - Oct. 75 (18-10-75)
68.	Do it as a play	Nava India - August 75

69.	*Parthenium* weed	Nava India 26-8-75 Malai Murasu 11-9-75 Dinamani 12-9-75 Indian Express 12-9-75 Hindu 12-9-75 Mahajanam 18-9-75 Tamil Arasu - October 75 Er Uzhavan 18-10-75 Uzhavar Thunaivan - October 75 Nilavalam - Oct. Nov. 75
70.	Farm size and loan requierment	Nava India 12-8-75
71.	How to plant coconut?	Nava India 12-8-75 Velalar Nalvalvu - August 75 Uzhavar Thunaivan - Aug-Sept. 75
72.	Change in market prices of pepper producation	Nava India 12-8-75 Tamil Arasu - Sep. 75 Uzhavar Thunaivan - October 75
73.	A study of previous season's campaign	Nava India 12-8-75 Tamil Arasu - September 75 Uzhavar Thunaivan - October 75
74.	Diseases of cotton and control measures	Uzhavar Thunaivan - July 75 Nava India 19-8-75
75.	Cropping systems	Farm & Factory - August 75
76.	Co.37 (Vaigai) responds well under low level of N	—do—
77.	Effect of granular application of insecticides against stemborer and gall fly in rice	Farm & Factory - August 75 Tamil Arasu - August 75 Uzhavar Thunaivan - Oct. 75 Mahajanam - Oct. 75 Uzhavar Selvam - September 75
78.	Drip Irrigation	Farm & Factory - Aug. 75
79.	Co. 36 rice suitable for *Samba* seasons	Farm & Factory - August 75 Malai Murasu - 19-12-75
80.	Herbicides in weed control	Farm & Factory - Aug. 75
81.	Foliar spray of urea on rice	Farm & Factory - Aug. 75 Mahajanam - October 75
82.	Controlling insects through ovicidal action of insecticides	Farm & Factory - August 75

83.	Reciamation of alkali soils through scientific approach	Farm & Factory - August 75
84.	Co. 38 paddy suitable for Thanja-vur *Thaladi* Crop	Indian Express - August 75
85.	Application of Phosfon-D on crossandra	Tamil Arasu - September 75 Uzhavar Thunaivan - Aug. Sept. 75
86.	Wonder Chemical	Indian Express 2-9-75 Dinamani 2-9-75
87.	Study on Soil analysis adoption	Indian Express 4-9-75
88.	Credit requirement and credit gap in agriculture	Tamil Arasu - September 75 Uzhavar Thunaivan - Aug. Sep. 75
89.	Water Management of rice	Tamil Arasu - September 75 Uzhavar Thunaivan - Aug.Sept. 75
90.	Citrus canker and its control	Tamil Arasu - Sept. 1975 Nava India 2-12-75
91.	Hand pruning and foliar feeding enhances flower production in roses	Uzhavar Thunaivan - Aug. - Sept. 75 Tamil Arasu - Sept. 75
92.	Economics of milk production	Tamil Arasu - Sept.75 Er Uzhavan - Sept. 75 (6-9-75)
93.	Reclamation of salt affected soils of North Arcot District	Uzhavar Thunaivan - Aug-Sept 75 Tamil Arasu - Sept.75
94.	Nituogen incraasns plotein and oil content in sunflower	Tamil Arasu- Sept. 1975 Uzhavar Thunaivan - Aug. Sept. 75 Mahajanam - October 75
95.	Importance of Development Programmes	Tamil Arasu - Sept. 75 Uzahavar Thunaivan - Aug-Sept. 75
96.	Sugary disease in cumbu	Nava India 26-8-75
97.	Another poisonus weed *Solanum elaeagnifolium*	Nava India 16-9-75 Uzhavar Thunaivan - November 1975
98.	Plants in pots	Uzhavar Thunaivan - July 75
99.	Village Society and Extension	—do—
100.	Moringa	Uzhavar Thunaivan - July 75 Nava india 25-11-75

101. Leafspot in tomato and its control	Uzhavar Thunaivan - July 75
102. Tasty recipes from mango nuts	Uzhavar Thunaivan July 75 Pannai Thozhil - Ocotober 75
103. Chillies nematode	Uzhaver Thunaivan - July 75 Kalanjiam – Malar 4 Ithal 3
104. Yield efficiency of coconut	Velalar Nalvalvu - Sept. 75 Uzhavar Thunaivan - October 75
105. Tamarind	Uzhavar Thunaivan - Aug.-Sept 75 Agriculture & Agro-Industries Journal - Dec. 75
106. Importance of Intensive Farming	Uzhavar Thunaivan - Aug.-Sept. 75
107. How to control powdery mildew disease of grapevine?	—do—
108. Changes ih efficiency of farming capital investment in Lower Bhavani Project.	—do—
109. Cultivation of food crops in the circle of leguminous crops	Uramum Payrirum - Sept. 75
110. Mushroom and its uses	Kalanjiam - Oct. 75 (Malar-4 Ithal-4) Nava India 7-10-75 Nilavalam - Oct.-Nov. 75
111. Selection in Bhendi	Kalanjiam – Oct. 75 (Malar 4, Ithal 4) Uzhavar Thunaivan – October 75
112. Feel sorry if rains	Nava India 7-10-75 Kalanjiam – Oct. 75 Mahajanam - Dec. 75
113. Cowpea yielded and pocket filled	Tamil Arasu - Oct. 75 Er Uzhavan - Nov. 75 Uzhavar Thunaivan – Nov. 75 Pannai Thozhil - Nov. 75
114. Optimum dose of fertilizer to get high yield in sugarcane	Er Uzhavan - Oct. 75 Nava India 21-10-76 Pannai Thozhil - Oct. 75 Malai Murasu - 12-12-75
115. Management of irrigated water and food problem	Nava India 28-10-75 Er Uzhavan - Oct. 75
116. Redgram disease and their control	Er Uzhavan - Oct. 75

117.	Co. 6304 Sugarcane gives high yield	Er. Uzhavan - Ocotober 75 Nava India 21-10-75 Pannai Thozhil - Dec. 75
118.	One Banana for each house	Er Uzhavan - Ocotober 75 Nava India 17-11-75 Nilavalam - Oct.-Nov. 75
119.	Drip irrigation for cotton	Nava India - 7-10-75 Uzhavar Thunaivau - October 75 Nilavalam - Oco. 1975 Uramum Payirum - January 76
120.	Sogai disease in sugarcane and its control	Nava India 7.10.75 Uzhavar Thunivan November 75
121.	Restoring underground water	Nava India - 21.10.75
122.	How to control rats before we are affected?	Nava India 2.12.75
123.	Fodder grass	Er Uzhavan - October 75 Mahajanam - December 75 Nava India 16.12.72
124.	How to preserve seeds?	Mahajanam - Ocotober 75
125.	How to preserve watar in dry-lands and get increased yield?	Nava India 21-10-75
126.	Herbicide for cumbu	Nava India 18-11-75
127.	Progress in irrgation system	Nava India 7-10-75
128.	Fish culture in cement tubs	Nava India - 11-11-75
129.	Tomato and its uses	Nava India - 29-11-75
130.	Leaders	Indian Express 24-12-75
131.	Colour combination for poster	Indian Express 24-12-75
132.	Increased yield in paddy by spraying urea	Pannai Thozhil November 75
133.	Neem in Agriculture	Pannai Thozhil - November 75 Er Uzhavan - November 75 Nava India 16-12-75
134.	One drumstick for each house	Pannai Thozhil - December 75
135.	Fish for nutritious food	Nava India 27-11-75

136.	To destroy weeds in ragi with minimum cost	Nava India -2-12-75
137.	New hybrid cholams	Nava India - 16.12.75
138.	Stem borer in paddy	Nava India 16-12-75
139.	Co. 3 Blackgram	Indian Express 15-1-76 Financial Express 15-1-76 The Mail 15-1-76
140.	Co. 3 Greengram	The Mail 15-1-76
141.	Co. 1 Snake groud (English) (Tamil)	The Mail 15-1-76 Nava India - 6-1-76
142.	Co. 1 Bhendi (English) (Tamil)	Nava India 15-1-76 - 6-1-76
143.	Co. 1 Tapioca (English) (Tamil)	Nava India 15-1-76 -6-1-76
144.	Co. 1 Sweet potato (English) (Tamil)	Nava India 15-1-76 6-1-76
145.	Co. 1 Ribbed groud (English) (Tamil)	Indian Express 15-1-76 Nava India 6-1-76
146.	Philosophy of Education in Farm Varsity	Indian Express 14-1-76
147.	Study on retention of knowledge gained through extension methods	Indian Express 14-1-76
148.	Give Iron nutrient and increase sugarcane yield	Uramum Payirum - January 75
149.	Phosphorus for paddy	—do—
150.	Transplanting papaya plants after flowering	—do—
151.	Wilt disease of cotton - a summary	Er Uzhavan - January 76
152.	Path is seen, continue the travel	—do—
153.	Various preparations with papaya	Er Uzhavan - 8-11-75
154.	Tamarind products	Nava India 5-11-75
155.	Poor Man's apple	Tamil Arasu 1-1-76
156.	Preparation from Mango Kernal	Er Uzhavan - 31-5-75 Pannai Thozhil - October 75

157.	Food products from fruits and vegetables	Valarum Velanmai-January 1976
158.	Principles of manuring coconut palm.	Seminar on Coir Industry Souvenir-75 (Published by Dept. of Industries & Comm.)
159.	Improved cultivation practices for coconut	—do—
160.	Coconut Station points way to raise yield	The Hindu 2-1-76
161.	Transplanting coconut palms	The Hindu 13-12-75
162.	Mulberry cultivation and silkworm rearing	Valarum Velanmai-1 (2) 13-24.
163.	Migration to cities - A Coimbatore study	Indian Express 12-2-76
164.	Atemoya - New fruit for the plains	Hindu 19-1-76
165.	Radio and Agriculture	Valarum Velanmai - April 75
166.	Method of adopting new ideas	Valarum Velanmai - July 75
167.	Delay in soil analysis	The Indian Express 4-9-75
168.	Role of Farmer's Training Centre	The Indian Express 20-11-75
169.	The posters they prefer	The Indian Express 18-12-75
170.	Shift in Leadership pattern of villages	The Indian Express 25-12-75
171.	How do Gramasevaks work on their role?	The Indian Express 1-1-76
172.	Indian farmers are more receptive to new methods	The Indian Express 15-1-76
173.	Animal Science in Kurunthogai	Uzhavar Thunaivan -
174.	"Varappuyara" - A critical study	Uzhavar Thunaivan - December 75
175.	"Payiriyal Poonga" - A poem on Botanic Garden	Valarum Velanmai - January 76
176.	Kudumba Vilakku - A series of 16 essays	Er Uzhavan - 12-7-75
177.	Improved methods of fertilizer application	Uzhavar Thunaivan - January 76

178. Kitchen Garden	—do—	December 75
179. Bhavani in single crop lands in Periyar Command Area	—do—	May-June. 75
180. Apply fertilizer at the right time to rice	—do—	November 75
181. Grow blackgram in rice fallows under less moisture level and get higher yield.	—do—	April 75
182. Water requirement for groundnut	—do—	May-June 75
183. Rice cultivation and irrigation	Madurai Productivity Council Seminar Special Issue - December 1975	
184. Fertilizer requirements for coffee	Uzhavar Thunaivan - April 75	
185. Control of pests in brinjal-a new approach	—do—	Vol. 4
186. Pests of rice and their control	Madurai Productivity Council Souvenir on Rice Production, 1975	
187. Diseases occuring on cotton	Souvenir of cotton Agricultural Seminar, 1975. The Rotary Club of Rajapalayam	
188. Cultivation of chow-chow	Pannai Thozhil - February 75	
189. Growth regulators application in vegetables	Uzhavar Thunaivan - March 75	
190. Saffron	Pannai Thozhil - May 75	
191. To get more yield in sweet potato	—do—	July 75
192. An analysis of different cultivars of guava	Uzhavar Thunaivan - Aug-Sept. 75	
193. A trial on the season of sowing in bitter groud	—do—	October 75
194. An introduction of a new vegetable TINDA	—do—	November 75
195. Suitability of sapota under Madurai conditions	—do—	December 75
196. Production and Marketing of jasmine flowers	—do—	July 75

197. Uyarvilaichal Nel Rakamum Palvagai Vivasaykalin labamum	—do—	Vol.4, No.1, April 75
198. Ulavarkal Virumbum pannai oliparapum muraigal	—do—	Vol.4, 5, 6 - Aug-Sep. 75
199. Velan Virivakka kalvikku Siranthathu Madakiya	—do—	Vol.4, No.8 - Nov. 75
200. Viriviyal Suya Vimarshanam	—do—	Vol.4,No.9 - Dec 75
201. Effect of improved methods of cultivation in sunflower on the changes in soil micro flora including *Azotobacter*	—do—	July 75
202. Effect of *Azotobacter* in increasing the yield of paddy	—do—	March 75
203. Cure of plant diseases by antibiotic compounds	—do—	July 75
204. Control of Tikka leaf spot disease	-do-	April 75
205. Vazhai Payiriduvorin Kalvi Munetram	-do-	February 75
206. Illakkiyathil Kotimalarkal	-do-	April 75
207. Cinthu Samaveliyil Velanmai	-do-	May-June 75
208. Velanmai Akarathi Thokuppu	-do-	July 75
209. Thetiyavai Thernttu varum	Uzhavar Thunaivan	Aug-Sep 1975
210. Thakkli Ini Thallathalkkum	-do-	October 75
211. Vatum Nilai Vativita	-do-	November 75
212. Munvanthu Ketidiweer	-do-	December 75
213. Paiynthu Odinan	-do-	Jan.-Feb. 76
214. Arisi Vagaikalil Puratham"	Valarum Velanmai	Jan. 76
215. Early sowing of rainfed cotton fetches more return	Uzhavar Thunaivan	May-June 1975
216. Problems of plant protection measures in rainfed cotton and ways to overcome them	-do-	July 75

239. Disease of sugarcane and their control	Er Uzhavan - 35(2) 1975
240. Reclamation of saline and alkali soils	Valarum Velanmai - April 75
241. Radio Inotopes in Agriculture	Valarum Velanami - October 75
242. Role of micronutrients in plant nutrition	Madurai Productivity Seminar December-75
243. Measuring the Dept Carrying capacity of a Farm	Kisan world-April 75
244. Tamil Nadu Farm wages Inadequate	Fiancial Express dated May 2, 75
245. *Influencing size of Holdings on certain Factors of Farm Management*	*Kisan world, May 75*
246. Farm labour Pattern in Tamil Nadu	Economic Times - May 11, 1975
247. Studies on Small Farmers and Agricultural labourers	i. Reports of the Ministry of Agriculture Govt. of India. Department of Agriculture ii. Bulletin of the Madras Institute of Development studies Vol. 5 No. 7-July 75.

217.	Natural organic manure	Valarum Velanmai-vol. I, 1975
218.	Velanmai Bowthigam	Valrum Velanmai
219.	Velanmai Valarchikku Payanpadum Sakthikal	-do-
220.	Response of irrigated jowar to Phosphorus	Kalanjiyam - Vol. 6, No. 4
221.	Induced Breeding work in Fish culture	Pannai Thozhil -April 75
222.	Composite Fish Culture	--do-- October 75
223.	Suplementary Feeding to Fish	--do-- November 75
224.	Breeding techniques in Common Carp	-do- December 75
225.	New groundnut strains	Indian Express 3-10-75
226.	Your brinjal crop in danger	Kisan world - March 75
227.	Head rot disease of sunflower	Kisan world - Aug. 75
228.	Powdery mildew disease of blackgram and greengram	Kisan world - Oct. 75 Uzhavar Thunaivan - April 75
229.	Mossaic disease of chilli	Uzhavar Thunaivan - May-June 75
230.	Ragi blast disease	Uzhvar Thunaivan - July 75
231.	Mushrooms and their uses	Kalanjium 75
232.	Leaf spot of tomato-Control of *Alternaria*	Kisan world, Annual Number 1975
233.	Powdery mildew of bhendi and its control	Pannai Thozhil - April 75
234.	Methods to increase the yield of gingelly	Malai Murasu 20-5-75
235.	How to protect cotton from diseases?	Malai Murasu 27-5-75
236.	Diseases of cotton and their control	Nava India - 19-8-75 Tamil Arasu 1-9-75
237.	Sulphur is a good protectant to gingelly	Nilavalam - April 75
238.	Disease of turmeric and their control	Kalanjium - May 75

239.	Disease of sugarcane and their control	Er Uzhavan - 35(2) 1975
240.	Reclamation of saline and alkali soils	Valarum Velanmai - April 75
241.	Radio Inotopes in Agriculture	Valarum Velanami - October 75
242.	Role of micronutrients in plant nutrition	Madurai Productivity Seminar December-75
243.	Measuring the Dept Carrying capacity of a Farm	Kisan world-April 75
244.	Tamil Nadu Farm wages Inadequate	Fiancial Express dated May 2, 75
245.	Influencing size of Holdings on certain Factors of Farm Management	Kisan world, May 75
246.	Farm labour Pattern in Tamil Nadu	Economic Times - May 11, 1975
247.	Studies on Small Farmers and Agricultural labourers	i. Reports of the Ministry of Agriculture Govt. of India. Department of Agriculture ii. Bulletin of the Madras Institute of Development studies Vol. 5 No. 7- July 75.
248.	இந்திய வேளாண்மை வளர்ச்சி ஒரு கண்ணோட்டம்	Valarum Vezlanmai - June 75 p. 55-75
249.	Tomato Growers Plight	Indian Express - 25-9-75
250.	தொழிலாளர் வாழ்க்கைத் தரம்	Valarum Vezlanmai - Jan. 75
251.	Rice in Tamil Nadu	Valarum Velanamai - January 76
252.	High yielding Forage crops	Valarum Velanmai - April 75
253.	Pyrethrum cultivation in Kodaikanal	Dinamani - 9-1-76 Indian Express - 9-1-76 News letter - December 75
254.	Kalappina Pasukkalin Paal Urpathiyil Pangu	Valarum Velanmai - Vol. 1:2
255.	Kozhikalin Veliyurai Ottunni Ozhippu Murai	Kalanjiam - 1974-75
256.	Veeriya Vellai Leghorn Kozhıgalin Urpathyilulla Selavinangal	Kalanjiam 1974-75

257. Siru Nilakilargalin Porulatharathil Veeria ina Iraichi Kozhigalin Pangu	Tamil Arasu - 1-6-75 Vol. 5:23
258. Lucerne Hay as cattle Feed	Er Uzhavan 1975
259. Pest control in *Sesamum*	Kissan World 2: p.39
260. New plant protection measures for the control of bhendi pests (Tamil)	Kalanjiam 3:7
261. New plant protection measures for the control of brinjal pests (Tamil)	Kalanjiam - 3:14
262. Plant parasitic nematodes (Tamil)	Valarum Velanmai. 1:
263. Root-knot of chillies (Tamil)	Kalanjiam 4. Nava India - 29-4-75 Malai Murasu - 6-5-75
264. Nematodes of banana	Kissan World 7
265. Root-lesion nematode of cros-sandra (Tamil)	Kalanjiam 3.
266. Pests of minor millets (Tamil)	TNAU News Bull. 30
267. Cotton stem weevil and its control	Kisan World 2, 32-33 Samuthayam (Tamil 14:6
268. Mango responds to pruning	Indian Horticulture - Oct-Dec. 1975
269. Pruning-a new technique for mango growers	Agriculture and Agro-industries Journal - September 75
270. Papaya	Valarum Velanmai - April 75
271. Pruning - a new technique in mango culture (English)	Hindu - 28-7-75 Tamil Arasu - September 75 Financil Express - 28-7-75
272. Ethrel	Kalaikathir - July 75
273. Robusta Banana	Valarum Velanmai - April 75
274. Papain from papaya	Kissan world - December 75
275. Ethrel is here to help in maturing and changing the sex	Kissan world - February 75
276. Ethrel and tubers	Kissan world - March 75
277. To increase the yield of mango	Nilavalam - August 1975

Z78. Sweet potato	Valarum Velanmai - October 75
279. Ethrel in Horticutture	Kalanjiam - 1975
280. Tapioca	Valarum Velanmai - July 75
281. Agro techdiques for maximising yields in vegetable crops	Indian Farmers Digest - 1975
282. Tapioca	Kalanjiam - 1975
283. Double planting in Robusta banana	Pannai Thozhil – 1975
284. What next in Fruit Research?	Kisan world - 1975
285. Tomato	Valarum Velanmai - 1975
286. New vegetable varieties	Hindu 6-1-76
287. New variety of Ladies Finger	Indian Express - 6-10-75
288. A promising selection in Bhendi	News letter - November 75
289. Rataoning in Robusta banana	Uzhavar Thunaivan - May-June 75
290. Double your profits with double planting	Uzhavar Thunaivan - May-Jund 75 Er Uzhavan - 29-11-75 Nava India 25-11-75 Nilavalam - December 75
291. Nutrients for papaya	Uzhavar Thunaivan - May-June, 75
292. Pruning-A new technique for mango growers (Tamil)	Er Uzhavan - 9-8–75 Nava India 29-7-75 Malai Murasu - 5-8-75 Nilavalam – July-August 75 Tamil Arasu - August 75 Uzhavar Thunaivan - Aug.-Sep. 75 Pannai Thozhil - October 75

APPENDIX VIII

LIST OF TAMIL NADU AGRICULTURAL UNIVERSITY PROGRAMMES OF A. I. R.

1. Recent trip abroad - Talk by the Vice-Chancellor
2. Pongal message to farmers - Talk by the Vice-Chancellor
3. Scientific Workers Conference and Annual Day of Colleges - Feature Programme
4. Farmers' Day - Feature Programme
5. Fourth Convocation of Tamil Nadu Agricultural University - Feature Programme

1. FACULTY OF AGRICULTURE

AGRONOMY

6. Preparation of land for cotton
7. Manuring of cotton
8. After cultivation in cotton
9. Weeds that harm mankind
10. Improved cultural practices for minor millets
11. Improved cultural practices for rainfed cholam
12. Improved cultural practices for rainfed cumbu

AGRICULTURAL BOTANY

13. Improved strains of sroghum for Rainfed conditions - Talk
14. Improved strains of cumbu suited for dryland farming - Talk
15. Strains of minor millets suited for dryland farming -,Talk
16. Fodder crops suited for Coimbatore Region - Talk

SOIL SCIENCE AND AGRICULTURAL CHEMISTRY

17. Reclamation of saline and alkali soils

AGRICULTURAL ENTOMOLOGY

18. Grapevine nematode and its control - Interview

HORTICULTURE

19. Cultivation of tuber crops-Talk
20. Peas and beans-Talk
21. Winter vegetables-Talk
22. Cultural hints for kitchen gardens for February-Talk
23. Cultivation of brinjal-Talk
24. Systems of vegetable cultivation-Talk
25. Cultivation hints in vegetables-Talk

26. Kitchen garden-Talk
27. Cultivation of gourds-Talk
28. Cultivation of bulb crops and greens-Talk
29. Importance of vegetable cultivation-Talk
30. Tomato cultivation-Talk
31. Recent trends in vegetable culture-Talk
32. Principles of vegetable production-Talk
33. Cultivation of chillies-Talk
34. Cultivation of perennial vegetables-Talk
35. Cultural hints for kitchen gardens for March-Talk
36. Cultural hints for kitchen gardens for December and January-Talk
37. Pruning in Mango-Talk

FOOD TECHNOLOGY

38. Mango products and their preservation
39. Various preparations with papaya
40. Food products from minor millets
41. Some food products from minor millets
42. Ready mixes from minor millets

ANIMAL HUSBANDRY

43. Role of poultry industry in the economy of our country
44. Breeds of poultry
45. Poultry housing and equipments
46. Incubators and methods of incubation
47. Rearing of chicks
48. Anatomy and physiology of digestive system of poultry
49. Feeds for poultry
50. Methods of feeding poultry
51. Diseases of poultry
52. Prevention and control of poultry diseases
53. Selection of chicks and adult birds for production
54. Marketing of eggs and meat
55. Poultry farm economics
56. Special feature on activities of Animal Husbandry Department
57. Seyarkkai Murai Karutharippu
58. Kaalnadai Valarppu Panigal
59. Kaalnadayai Thakkum Komari Noi

FORESTRY

60. Activities of the Department of Forestry-Interview
61. Plans of forest development in Coimbatore district-Talk

FISHERY SCIENCE

62. Activities of the Department of Fishery Science–Talk
63. New findings in fish rearing–Talk
64. Fish rearing in water storages–Talk

SEED TECHNOLOGY

65. Activities of the Department of Seed Technology-Feature Programme

PLANT PATHOLOGY

66. Bunchy top disease of banana-An Interview

AGRICULTURAL ECONOMICS

67. Role of cooperatives in the need of agricultural loans-Talk
68. Our problems in marketing agricultural produce-Talk.

II. FACULTY OF AGRICULTURAL ENGINEERING

69. Cotton Irrigation - Talk
70. Best channel for thrift irrigation - Talk
71. Selection of pumpsets for agricultural farms - Talk
72. Advancement in irrigation - Drip irrigation - Talk
73. Water management in paddy fields - Talk
74. Reinforcing ground water - Talk
75. Forests and soil conservation - Talk

III. FACULTY OF BASIC SCIENCES AND HUMANITIES

76. Things to be observed during rearing silk worms

IV. EXTENSION EDUCATION

77. Activities of Tamil Nadu Agricultural University Communication Centre - Talk
78. Agricultural question per second - Quiz programme
79. Rat control campaign - Feature programme.

THE University wishes to place on record its grateful thanks to the Chancellor, the Chief Minister, the Pro-Chancellor and Minister for Agriculture, Advisers to Governor, the Chief Secretary and Secretaries heading the administration of the State Government, the Heads of Departments of the State Government and several other officials of the Government for their generous help and whole hearted support given in building this young University. The guidance and support given by the members of the Board of Management, Academic Council, Board of Studies, Board of Examinations, Research Council, Extension Education Council and several other *ad hoc* committees appointed by the University are gratefully acknowledged.

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The willing co-operation and sincere efforts put in by the officers, teachers, scientists, students, technicians, administrative and supporting staff have helped the rapid growth of the University. The inspiration for service to humanity particularly to the rural community was obtained through the farmers who came in contact with the staff of the University located in different parts of the State. The University requests the farming community, the general public and every one within and outside to continue to guide, inspire and extend their help and co-operation for more rapid growth so that it could be of better service to them.